



EXPLORING THE WORLD OF

MAMMALS



EXPLORING THE WORLD OF MAMMALS



Aar–Wom

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INTRODUCING MAMMALS

Asked to describe a mammal, most people might say, quite correctly, a warm, furry animal that feeds its young on milk. There are around 5,000 different species of mammals, all of which have hair or fur, a constant internal body temperature (are “warm-blooded”), and feed their offspring on milk. The milk is usually produced from special skin organs called mammary glands. However, not all mammals look alike. Bats, bears, whales, wallabies, hedgehogs, and hippopotamuses—each of these extremely diverse animals is a mammal. Humans are mammals, too, and are grouped with chimpanzees, gorillas, and orangutans.

Between them, mammals have adapted their body shapes and behaviors to live practically all over the world and are therefore among the most successful

animals on Earth. Some mammals can fly, some can swim, while others burrow below ground, run or jump across the surface, or climb trees. Some mammals, such as polar bears and dolphins, are carnivores and eat only meat; others, such as giraffes and pronghorn, are herbivores, or plant eaters. Many other species of mammals are omnivores that eat both plants and animals. Omnivores include raccoons and badgers.

The three main groups of mammals are the egg-laying monotremes (platypus and echidnas); marsupials, such as koalas, kangaroos, and opossums, which give birth to highly undeveloped offspring and raise them in pouches; and placentals, the females of which nurture their babies inside their body in the uterus before giving birth to well-developed young.

Exploring the World of Mammals

From aardvarks to wombats, these six volumes of *Exploring the World of Mammals* provide more than one hundred articles that describe in detail particular species and groups of mammals. Most are general articles about individual mammal species, such as colobus monkeys, hippopotamuses, or tapirs. Other articles are more specific, providing an overview of an entire order (large group) of mammals, such as bats or carnivores, or a family of mammals, such as bears or cats. These specific articles are shown in bold type on the table of contents in each volume.

Each volume has a number of useful features, including: a mammalian family tree, which shows how mammals fit into the animal kingdom, how they are related to one another, and provides cross references to articles in this encyclopedia; a glossary of terms used throughout the set; a section entitled

Further resources, which includes further reading and Internet resources; and a volume-specific index. Volume 6 contains a complete set index.

Every article has a Fact File box, which summarizes a mammal's family and order, explains how many species exist, and shows a detailed map of where the mammal lives. In addition, there are facts about the mammal's habitat, size, coat, diet, breeding, life span, and status according to the World Conservation Union (IUCN; see opposite). Other items include boxes that provide more in-depth information about specific details and a Did You Know? feature that presents interesting facts about specific mammals. Throughout, there are large, colorful photographs and illustrations that increase the reader's enjoyment and enhance an understanding of the world of mammals.

Carnivore, herbivore, insect eater, or omnivore?

Above the Fact File in each general article is a colored tag and a small illustration that highlights whether a particular mammal is a carnivore (meat eater), an insect eater, a herbivore (plant eater), or an omnivore (one that eats both plants and animals). As a general description here, *carnivore* describes any mammal that eats animal food, rather than more specifically a member of the order (large group) of mammals called Carnivora. Armadillos and anteaters are listed as insect eaters because they eat ants and termites, but they are also

carnivores because they eat animal food. The category chosen for each article covers the majority of members of the group of mammals being described and the bulk of the animal's diet. For example, baboons and macaques are described as omnivores because most species eat both plant and animal food. However, the gelada baboon eats only grass, which makes it a herbivore. Similarly, gorillas are listed as herbivores (plant eaters) because they eat mostly leaves, fruit, shoots, and bark, although they also eat a few termites and caterpillars.



CARNIVORES



HERBIVORES



INSECT
EATERS











OMNIVORES

World Conservation Union (IUCN)

The World Conservation Union (IUCN) is the world's largest and most important conservation network. Its mission is to help protect all living organisms and natural resources by highlighting those threatened with extinction and therefore promote their conservation.

An organism may be placed in one of the following categories in the *IUCN Red List of Threatened Species*:

-  **Extinct**—there is no reasonable doubt that the last individual has died
-  **Extinct in the wild**—an organism survives only in captivity, in cultivation, or as a population well outside its past range
-  **Critically endangered**—facing an extremely high risk of extinction in the wild
-  **Endangered**—facing a very high risk of extinction in the wild
-  **Vulnerable**—facing a high risk of extinction in the wild
-  **Near threatened**—likely to qualify for a threatened category in the near future
-  **Least concern**—is not threatened
-  **Data deficient**—inadequate information exists to make an assessment

The status of each mammal or group of mammals according to the IUCN is highlighted at the foot of the Fact File in every article.

Classifying mammals

Scientists group together, or classify, animals that have a common ancestor and therefore share similar physical features and genes (sections of DNA, or deoxyribonucleic acid). That common ancestor might have lived millions of years ago. The family tree shown overleaf reveals the relationships among mammals. All mammals belong to the class Mammalia, which is divided into several large groups called orders that contain more closely related mammals. In turn, each order of mammals is divided into smaller groups called families, which contain even more closely related mammals. For example, the order Cetacea includes all whales and dolphins. Within this order are several families, including Delphinidae, which covers dolphins. Delphinidae is further divided into seventeen smaller groups called genera (singular genus), which contain several individual species, or types, of dolphins. The species is the smallest category of biological classification. Animals belonging to the same species can breed together successfully to produce fertile offspring.

MAMMALIAN FAMILY TREE

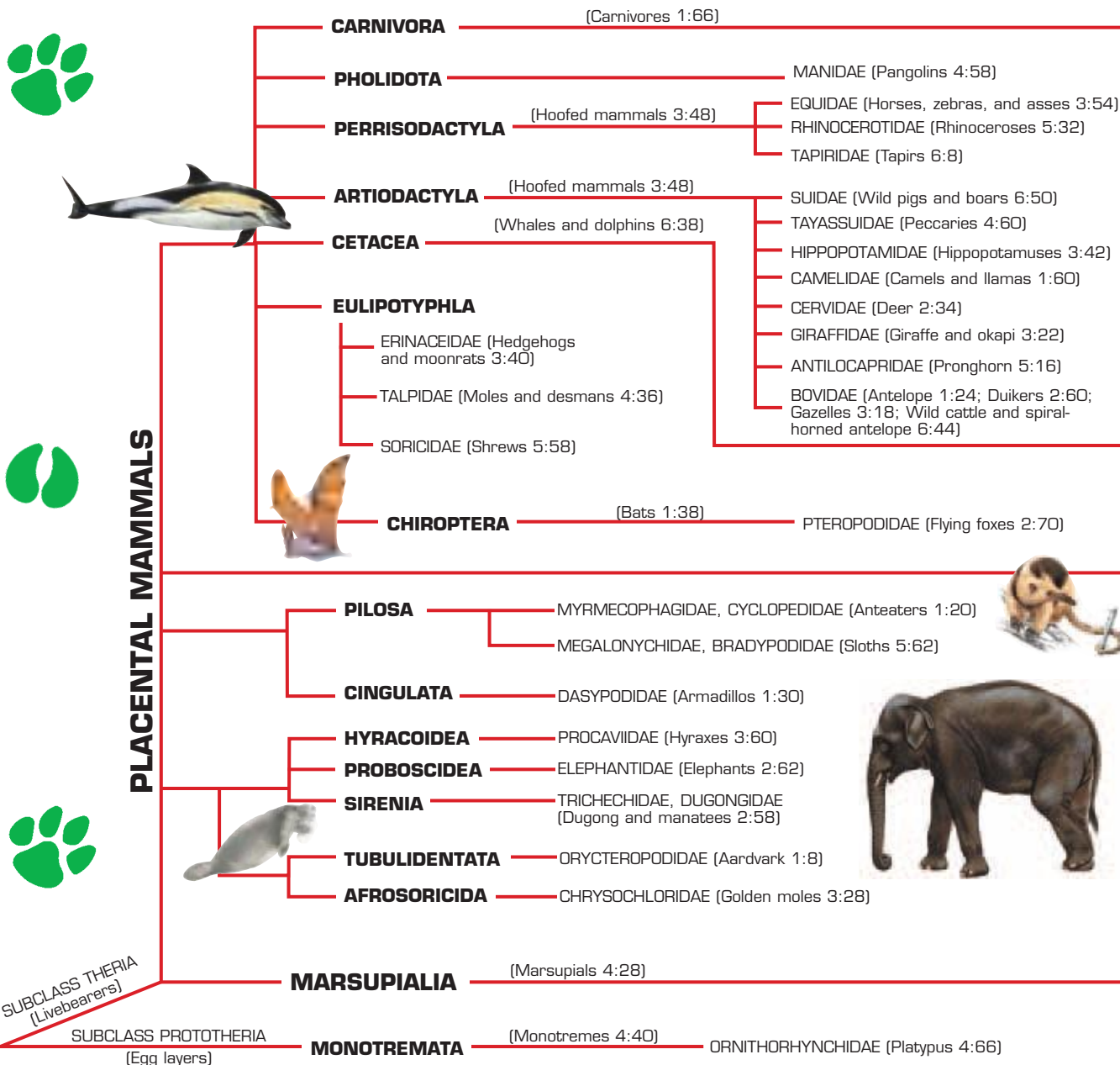
ANIMAL KINGDOM
(Animalia)

Animals with a backbone
(PHYLUM Chordata,
SUBPHYLUM Vertebrata)

CLASS:
BIRDS (Aves)
REPTILES (Reptilia)
AMPHIBIANS (Amphibia)
FISH (Osteichthyes—bony
fish, Chondrichthyes—
cartilaginous fish)
MAMMALS (Mammalia)



The numbers below refer to volume and page numbers where a particular animal group is discussed in an article.



- MUSTELIDAE (Badgers 1:36; Marten 4:34; Otters 4:52; Weasels, mink, and polecats 6:34; Wolverine 6:54)
- MEPHITIDAE (Skunks and stink badgers 5:60)
- PROCYONIDAE (Coatis 2:24; Raccoons 5:24)
- PHOCIDAE, OTARIIDAE (Seals 5:50)
- OBENIDAE (Walrus 6:30)
- URSIDAE (American black bear 1:14; Bears 1:44; Brown bear 1:54; Giant panda 3:16; Polar bear 4:68)
- CANIDAE (African wild dog 1:10; Coyote 2:32; Dogs 2:42; Dhole 2:40; Ethiopian wolf 2:68; Foxes 2:72; Jackals 3:62; Wolves 6:58)
- FELIDAE (Cats 1:72; Cheetah 2:8; Leopard 4:12; Lion 4:16; Tiger 6:18)
- HERPESTIDAE (Mongoose 4:38)
- VIVERRIDAE, NANDINIIDAE (Civets and genets 2:20)



- MONODONTIDAE (Beluga and narwhal 1:52)
- DELPHINIDAE (Dolphins 2:46)
- ESCHRICHTIIDAE (Gray whale 3:34)
- PHOCOENIDAE (Porpoises 5:8)
- BALAEINIDAE, NEOBALAEINIDAE (Right whales 5:36)
- BALAEINOPTERIDAE (Rorquals 5:46)
- PHYSETERIDAE (Sperm whales) 5:66)



- RODENTIA** (Rodents 5:40)
- LAGOMORPHA**
 - LEPORIDAE (Rabbits and hares 5:18)
 - OCHOTONIDAE (Pikas 4:62)
- PRIMATES** (Primates 5:10)
- SCANDENTIA**
 - TUPAIIDAE, PTILOCECERIDAE (Tree shrews 6:24)

- CASTORIDAE (Beavers 1:48)
- SCIURIDAE (Squirrels 5:70)
- MURIDAE (Gerbils 3:14; Hamsters 3:38; Rats and mice 5:26; Voles and lemmings 6:26)
- MYOXIDAE (Dormice 2:54)
- DIPODIDAE (Jumping mice, birchmice, and jerboas 3:64)
- ERETHIZONTIDAE, HYSTERICIDAE (Porcupines 4:72)
- HYDROCHAERIDAE (Capybara 1:26)
- CERCOPITHECIDAE (Baboons and macaques 1:32; Colobus monkeys 2:26)
- HOMINIDAE (Chimpanzees 2:14; Gorillas 3:30; Orangutans 4:48)
- TARSIIDAE (Tarsiers 6:12)
- HYLOBATIDAE (Gibbons 3:18)
- CALLITRICHIDAE (Marmosets and tamarins 4:22)
- CEBIDAE, AOTIDAE, ATELIDAE, PITHECIIDAE (New World monkeys 4:42)
- GALAGIDAE, LORISIDAE (Bush babies 1:58)
- LEMURIDAE, LEPILEMURIDAE, CHEIROGALEIDAE, INDRIDAE, DAUBENTONIIDAE (Lemurs 4:8)

- DIDELPHIMORPHIA** — DIDELPHIDAE (American opossums 1:16)
- DIPROTODONTIA**
 - MACROPODIDAE (Kangaroos and wallabies 3:66)
 - PHASCOLARCTIDAE (Koala 3:72)
 - TARSIPEDIDAE (Honey possum 3:46)
 - VOMBATIDAE (Wombats 6:64)
- DASYUROMORPHIA** — DASYURIDAE (Tasmanian devil 6:14)



AARDVARK

These shy animals are not often seen. Many details of their daily life remain a mystery, but one thing is for sure—there is nothing aardvarks like better than a nest full of termites.





Aardvark means “earthpig” in the Afrikaans language of South Africa. This unusual-looking animal spends every night rooting about and digging for ants and termites, which it sniffs out with its sensitive nose. Once it has found a nest, an aardvark starts digging. Its strong, broad claws can break ground that has baked as hard as a rock in the sun. The aardvark shoves its long snout into the nest and begins slurping up the insects. Its long tongue is covered in sticky saliva. Aardvarks do not chew their food. Instead, they swallow ants and termites whole. After a few minutes of feeding, the aardvark moves on. It spends the night walking around in search of nests to dig up. An aardvark can eat 50,000 termites in a single night.

Burrows and Babies

During the day, aardvarks rest in underground burrows, which they dig themselves. An aardvark can dig a burrow big enough to hide inside in just five minutes. Adult aardvarks live alone. Males and females probably meet only once a year to breed. Females have just one baby at a time. Mother aardvarks rear their offspring in a burrow with lots of tunnels and entrances.

Aardvarks have unusual teeth that continue to grow as long as the animal lives. The teeth are covered in a layer of bony material instead of enamel like human teeth. The teeth are one of the features that suggest the aardvark has no close living relatives.

An aardvark has long, tube-shaped ears that it uses to listen for predators. Its large snout is ideal for rooting in the ground to look for ants and termites.

Fact File

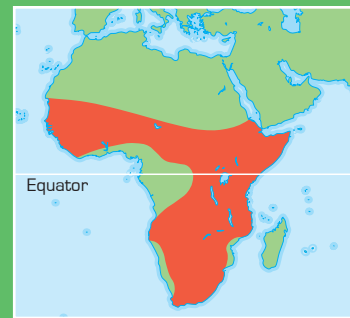
AARDVARK

Orycteropus afer

Family: Orycteropodidae

Order: Tubulidentata

Where do they live? Africa, south of the Sahara desert



Habitat: Open woodlands, scrublands, grasslands, and forests, but not on rocky or steep ground

Size: Head-body length 41–51 inches (105–130 cm); weight 88–143 pounds (40–65 kg)



Coat: Pale yellowish gray, often stained with soil

Diet: Ants and termites

Breeding: Single offspring born after 7-month gestation; can survive alone after one year

Life span: Up to 10 years in a zoo, less in the wild

Status: Not threatened

AFRICAN WILD DOG

African wild dogs know all about teamwork. They live in organized packs and travel, hunt, and rear their pups together. Each animal knows its place and depends on its companions for survival.





African wild dogs are slim, short-haired dogs with blotchy coats, large ears, and a bushy tail. They are sometimes called painted hunting dogs because of their coat pattern. These dogs are not very strong, but they are smart. By working together, African wild dogs can hunt animals much larger than themselves.

African wild dogs live in groups called packs. Each pack is led by a top pair, called the alpha male and female. Only the alpha male and female breed. The rest of the pack might be brothers, sisters, or offspring of the alpha pair. Every dog is important in the life of the pack. All the adults hunt together. The dogs that do not breed help the alpha pair rear their pups. Pack members feed and protect the puppies as though they were their own. With so many helpers, the alpha female can rear much larger litters than she could alone. It is common for a female to have ten or more puppies in a litter.

Pack Support

The puppies are born in a den. To begin with the mother stays with them to feed them milk. The rest of the pack go hunting and bring back food for her. The pups start eating meat after four or five weeks. At about four months old, the pups start trying to help the pack hunt. At first they just get in the way, but they learn fast. The adults let the pups eat first when a kill is made. By the time they are one year old, the pups are fully grown and ready to start looking after the next

Like other dogs, African wild dogs are perfectly equipped for hunting. Here, this African wild dog is displaying a mouth full of extremely sharp teeth.

Fact File

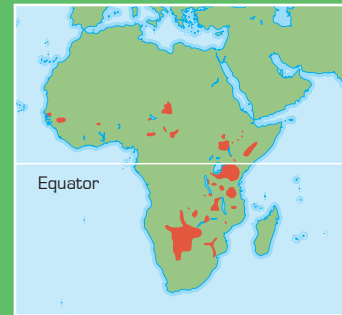
AFRICAN WILD DOG

Lycaon pictus

Family: Canidae

Order: Carnivora

Where do they live? Africa, south of the Sahara desert



Habitat: Open savanna woodlands and grasslands, dry scrublands, and hilly areas

Size: Head-body length 30–47 inches (75–120 cm); weight 44–71 pounds (20–32 kg)



Coat: Short and often thin; black, white, gray, yellow, and tan blotches and spots

Diet: Meat, mostly antelope but also carrion (dead animals) and some rabbits and buffalo calves

Breeding: Cooperative; around 10 pups per litter born to one female in a pack; 70 to 73 days' gestation; mature at 13–14 months

Life span: About 10 years

Status: Endangered; only around 5,500 survive in the wild

AFRICAN WILD DOG

generation. The pack moves around a lot, often sleeping in a different place each night, except when a new litter is ready to be born.

Hunting Parties

Wild dog hunts often start with a long journey in search of prey. Most packs prefer antelope, such as impala.

FRIENDLY RELATIONS

African wild dogs use greeting ceremonies to strengthen team spirit and to bond the hunting pack. These ceremonies usually take place around midday. All the members of the pack come together in an excited crowd. They run around, squeaking and nuzzling each other. The dogs do this before every hunt, just like a sports team going into a huddle before a game.



Sometimes the pack attacks water buffalo, wildebeests, and zebras. These large animals are not easy to kill. Usually, the pack has to chase the prey until it is too tired to fight. Then one of the dogs leaps up and drags the prey to the ground. The dogs eat fast. They try to gobble as much as they can before lions or hyenas turn up. Chunks of meat can be coughed back up again later, to feed puppies or other members of the pack.

Wild dogs sometimes get separated from the pack during a hunt. The others keep calling to help it find its way back. If a dog becomes sick or is injured, the rest



 An African wild dog pup begs food from its mother by touching and licking her face. Adult African wild dogs use this nuzzling technique during midday greeting ceremonies.




of the pack will protect it and bring it back food after a hunt. So wild dogs can sometimes recover from injuries that would be fatal to animals that live alone.

Endangered Dogs

Wild dogs are endangered for many reasons. They have natural enemies, including lions and hyenas, which steal their food and often attack and kill the dogs themselves. Wild dogs need a lot of space. But their habitat is shrinking as people clear land to farm or build towns. People have also hunted wild dogs for

hundreds of years because they think the dogs threaten their livestock. Many wild dogs are killed on roads, and thousands have died of diseases such as rabies, which can be spread by domestic dogs.

 A pack member has spotted an antelope and chases it. The whole pack will join in, running after the prey until it tires.

DID YOU KNOW?



No two wild dogs look the same—each one has its own unique coat pattern of blotches and spots.



Those big ears are sharp enough to hear another dog calling softly more than a mile away!



Wild dogs can run at speeds of up to 37 miles per hour!

AMERICAN BLACK BEAR

American black bears are by far the most common bear species. The secret of their success is a varied diet—these bears make a meal of almost anything.





Black bears live in many of the same areas as brown bears and grizzly bears, but black bears are smaller and much better at climbing trees. They live in a wide variety of habitats—from the dry scrublands of Mexico and steamy swamp forests of Florida, to the mountain woodlands of the Rockies and the bleak Canadian tundra (cold, treeless plains). Black bears living in the north are larger than those in the south. The extra weight helps them stay warm. Where winters are long and hard, black bears must fatten up in summer and spend the winter sleeping in a den. A bear can stay in its den for up to eight months, living off its fat reserves. In the southern United States and Mexico, however, black bears stay active all winter.

Winter Cubs

Black bears mate in summer. After mating, the male bear leaves the female alone. She usually gives birth to two or three tiny cubs in the middle of winter. In spring, the cubs start exploring and eating solid food. They usually leave at seventeen months old.

Black bears eat all sorts of things. In spring they eat fresh green shoots, buds, and insects. In summer and fall, they eat nuts and fruit. They also hunt animals, such as fish and small mammals up to the size of small deer. In many areas, black bears associate people with food, and they raid trash cans and crops. They are not normally dangerous to people unless provoked.

An American black bear cub. Cubs usually stay with their mother for around 17 months. During this time, they learn how to climb trees and find food.

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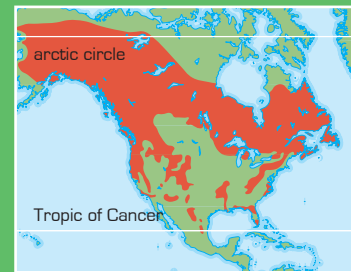
AMERICAN BLACK BEAR

Ursus americanus

Family: Ursidae

Order: Carnivora

Where do they live? Most of Canada, wilderness areas of the United States away from the central plains, and northern Mexico



Habitat: Forests, woodlands, and scrublands

Size: Head-body length 4–6 feet 3 inches (1.2–1.9 m); weight 130–880 pounds (40–400 kg)



Coat: Thick fur can be black, brown, red-brown, or blonde

Diet: Fruit, shoots, buds, catkins, insects, mammals, and fish

Breeding: Mate in summer; 26–34 weeks' gestation; 1–6 cubs born in January; mature at around 3–4 years

Life span: Usually 25 years, occasionally up to 35 years

Status: Not threatened, although some subspecies (local types) are becoming rare

AMERICAN OPOSSUMS

A few of these pouched mammals are familiar in different parts of the Americas, while others are seldom seen. They are all distant relatives of Australian marsupials, such as kangaroos and wombats.





Opossums are American marsupials. They are long-lost, distant relatives of the Australian possums, kangaroos, and koalas. Marsupials evolved more than 80 million years ago, when Australia and South America were part of the same ancient continent, Gondwana. There are ninety-two species of American opossums. They range in size from tiny mouse opossums, at 3 inches long, to the cat-sized Virginia opossum. Most species live in South and Central America, but the Virginia opossum is common in North America as far north as the Great Lakes.

Opossums have a pointed snout and long whiskers. Their eyes are big and bright, and their ears are large, with no fur. Most opossums have very good eyesight and hearing. The long, furless tail is prehensile in many species; it can curl and grip branches when climbing.

Varied Lifestyles

Adults of all species live alone, but their lifestyles vary. Several species, including the Virginia opossum, common opossum, white-eared opossum, and the four-eyed opossum are good climbers and eat almost anything that comes their way, including fruit, insects eggs, small mammals, and carrion. The Virginia opossum is familiar to millions of people as a backyard visitor and raider of trash cans. Other opossum species are suited to different ways of life. Woolly opossums, for example, are great tree

A Virginia opossum holds on tight to the branches of a tree. It has a prehensile (grasping) tail and five toes on each foot. Each toe bears a sharp claw.

Fact File

AMERICAN OPOSSUMS

Family: Didelphidae (92 species)

Order: Didelphimorphia

Where do they live? Most of South and Central America; Virginia opossum common in eastern United States and eastern Canada; introduced to Pacific coast

Habitat: Forests, grasslands, mountains; also in towns



Size: Head-body length 3–20 inches (7–55 cm); weight 0.5 ounce–12 pounds (13–5,500 g)

Coat: Some short and woolly, others short undercoat with shaggy top coat; color from dark gray-brown to brown, gold, or almost white; some species have markings on the face

Diet: Varies with species; some eat only insects and other animals; most eat both plant and animal food

Breeding: Tiny offspring born after 12–14 days' gestation; continue to develop in pouch or clinging to mother's fur

Life span: 1–3 years in the wild; up to 8 years in zoos

Status: Around half of the 92 known species may be at risk; 22 species are officially threatened

AMERICAN OPOSSUMS

climbers. They live in rain forests and dangle from the trees to reach fruit and flowers. The Patagonian opossum is a small, mouselike animal. It lives farther south than any other opossum and is thought to be a burrowing predator. The yapok spends a lot of its life in water. It has webbed hind feet that act as paddles. It dives to catch frogs, fish, and crustaceans, such as crabs and shrimps.

Mouse Opossums

Mouse opossums are the smallest members of the group. Some live in trees, while others spend their lives



scuttling around at ground level, like regular mice. The fat-tailed mouse opossum stores fat in its tail that helps it survive when food is scarce.

Tiny Babies


Female opossums usually produce large litters of tiny offspring. Newborn opossums must crawl up the mother's belly and latch on to one of her teats. Often there are fewer teats than there are babies. It is a case of first come, first served. Those that do not quickly find a teat will die.


In most species, the teats are inside a pouch. Scientists call this

DID YOU KNOW?


-  Newborn opossums can be so tiny that an entire litter fits in a teaspoon!
-  One Virginia opossum once produced a litter of 56 babies!
-  The yapok has a watertight pouch, which closes to protect the offspring when the mother dives.



 A Derby's woolly opossum rests in a tree. Like most opossums, it has a long, furless tail.

 A black-shouldered opossum climbs down a branch using its prehensile (grasping) tail.



 This Mexican mouse opossum is looking for food.






pouch a marsupium. However, not all female opossums have a well-developed pouch. In some opossums, such as mouse opossums, the pouch is just a fold of skin. Other opossums have no pouch at all. In pouchless species, the young opossums dangle from the teat or cling to the mother's fur. After a few weeks, the babies begin to move about on their mother's body, only coming back to the teat to feed. Most young opossums are weaned between two and three months old.

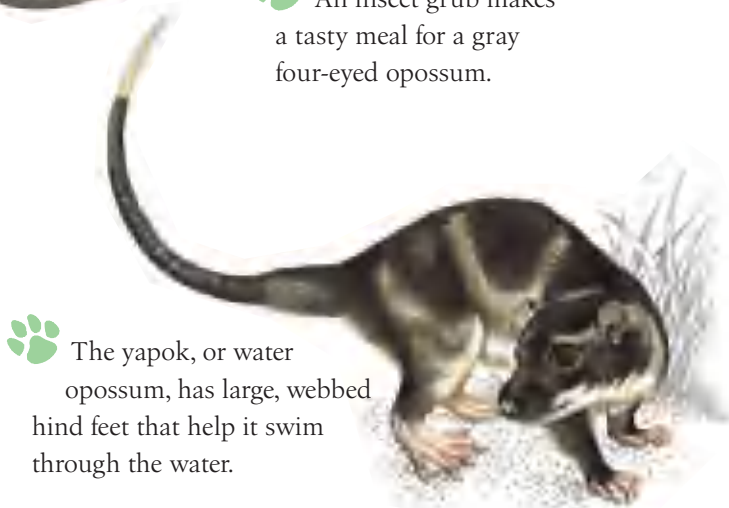



PLAYING DEAD

Opossums are famous for playing dead when they are in danger. They do this by keeling over with their legs stiff and tongue lolling. They do not move or even blink and can stay like this for hours. Then, when the danger has passed, they come back to life.



 An insect grub makes a tasty meal for a gray four-eyed opossum.



 The yapok, or water opossum, has large, webbed hind feet that help it swim through the water.

South American Relatives

Two other groups of South American marsupials are distantly related to opossums. Shrew opossums are small, nocturnal predators with unusually large incisor teeth for stabbing prey. The Moninto del monte from Chile is the only member of the other group. It is small and harmless, but local people think it brings bad luck.

ANTEATERS

Strange-looking, toothless anteaters are related to sloths, but their appearance and habits are very different. As their name suggests, anteaters live on a diet of ants and termites.





The four species of anteaters live in various parts of South America. All of them eat insects, such as ants and termites. The best-known species is the giant anteater. Giant anteaters live in the vast grasslands and swamps east of the Andes mountains. They may eat up to 35,000 large ants and termites a day. The two species of tamanduas are medium-sized forest and scrub dwellers. They spend much of their time in the trees. They eat up to 9,000 ants a day and also tackle bees.

The silky anteater looks more like a sloth than an anteater. Its body is no more than 8 inches (20 cm) long. This anteater has a long, furry tail that acts as a fifth limb for climbing. The silky anteater does not have a long snout, and its fur is short, dense, and very fine. It lives in tropical forests and comes down to the ground only to move from one tree to another. It eats tiny ants that nest in trees. Giant anteaters and tamanduas can be active by day or night, but silky anteaters are strictly nocturnal (night active).

Huge Claws

Anteaters have enormous claws. The claws are so large that anteaters cannot place the soles of their front feet on flat surfaces—when moving about on the ground they must walk on their knuckles. The ground-dwelling giant anteater uses its claws to break into logs and termite mounds as hard as concrete. Tamanduas and silky anteaters use their claws to grip branches

The giant anteater's long, tubelike snout ends in a tiny mouth opening. Its legs are short and sturdy in relation to its body size, and it walks on its knuckles.

Fact File

ANTEATERS

Families: Myrmecophagidae and Cyclopedidae [4 species]

Order: Pilosa

Where do they live? Southern Mexico, Central and South America, to Paraguay and northern Argentina



Habitat: Grasslands, swamps, scrublands, woodlands, and tropical forests

Size: Head-body length 18 inches–4

feet 2 inches [20–130 cm]; weight 13 ounces–86 pounds [0.375–39 kg]



Coat: Coarse and shaggy in giant anteater, soft and dense in silky anteater; pale grayish fawn to brown fur (plain in silky anteater), with dark flank markings in other species

Diet: Ants and termites

Breeding: Single offspring born after 120–190 days' gestation

Life span: Giant anteater up to 26 years in a zoo, smaller species are shorter lived

Status: Giant anteater is vulner




when climbing and to open up holes in tree trunks and branches.

Toothless Hunters




Anteaters hunt mainly by smell. They sniff out an ant or termite nest and then open a hole large enough to push their narrow snout in and begin collecting insects with the tongue.

Anteaters have no teeth. They do not need to chew their food. All the ants and termites they catch are swallowed whole. In the anteater's stomach, the insects are turned to pulp by the formic acid in the ants' own bodies. Unlike most mammals, anteaters do

 The southern tamandua has strong claws and a powerful tail. The tail can grip branches while the animal climbs, and also acts as a prop when the animal rears up on its hind legs.



DID YOU KNOW?

-  Young anteaters ride on their mother's back until they are nearly as big as she is!
-  Silky anteaters can sleep dangling upside down from tree branches!
-  The southern tamandua can have claws up to 16 inches long!

not need to produce strongly acidic stomach juices to get digestion started.

Raising Babies

All four species of anteaters usually live alone, except when rearing offspring. Female anteaters usually produce just one baby at a time. Silky anteater babies are cared for by both parents. They are sometimes left alone in a leafy nest while the parents go to feed. At other times, the babies accompany the adults, riding on the parent's back. Female tamanduas and giant anteaters also carry their offspring on their back.

Standing Its Ground

The giant anteater is too large to have many natural enemies. Pumas and jaguars may sometimes try to attack the giant anteater, but this animal knows how to defend itself. When



cornered, the giant anteater stands on its hind legs and slashes with its huge claws. It might even try to crush the attacker in a powerful bear hug. Tamanduas and silky anteaters are more vulnerable. They spend most of the time high in the trees out of reach of most large predators.

All species of anteaters are suffering from loss of habitat. Tamanduas and giant anteaters are also hunted for sport. They are also often killed by cars and bush fires.

FASTEST TONGUES IN THE WEST

All anteaters have a very long sticky tongue, which can flick in and out up to 150 times per minute. In tamanduas, the tongue can reach about 16 inches in length from the tip of the snout. The giant anteater can stick its tongue out up to 24 inches. The tongue is covered in little points, or barbs, that point backward. These barbs help snag the bodies of ants and termites. Anteaters also produce a lot of sticky saliva (watery mouth secretion).

ANTELOPE

Grazing antelope include some of the most numerous large animals in the world as well as some of the rarest.

These social animals are superbly adapted to the many different types of grassy habitats in Africa.





Several groups of mammals specialize in eating grass. Grass is an unusual plant. While most flowering plants, including herbs, shrubs, and trees grow from the tip, grasses grow from the base. Most plants start to decline if their tips are continually nipped off, but not grass. Regular trimming makes grass grow even faster. Animals that eat grass are called grazers. Africa has more grazers than any other continent, including many large mammals, such as zebras, rhinoceroses, and buffalo.

Grazing antelope are all members of the great group of hoofed mammals called artiodactyls. Grazing antelope belong to the same family as cattle, sheep, and goats. Grazing antelope are medium- to large-hoofed mammals with slim legs and a long face. Males and sometimes females have horns, and the neck is short and powerful to carry the weight of the horns. The horns are used for fighting other antelope for mates, territory, and food. Antelope live in groups for safety, and these groups can be very large.

Grazing Antelope Tribes

There are three tribes, or groupings, of grazing antelope, each of which lives in a different sort of grassy habitat. The first tribe, called Reduncini, live mainly in reedbeds and wetlands. They include the dainty reedbucks, the huge shaggy waterbuck, and medium-sized kob, lechwe, and puku. None of them

The bontebok has a distinctive white patch on the face. These grazing antelope live on the open grasslands of South Africa and are listed as being vulnerable.

Fact File

ANTELOPE

Family: Bovidae; subfamily Hippotraginae (23 species)

Order: Artiodactyla

Where do they live? Africa and Arabia



Habitat: Wet and dry grasslands
16,500 feet (5,000 m) below sea level

Size: Shoulder height 26–57 inches (65–145 cm);
weight 50–620 pounds (23–280 kg)



Coat: Varies from short and sleek to shaggy; color varies from pure white to black through fawn, gold, red, brown, and gray, often with striking markings on the face, rump, and legs; some species have a mane

Diet: Grass, herbs, and water plants


Breeding: Gestation 210–280 days;
1 calf, occasionally twins

Life span: Varies with species;
up to 22 years


Status: Varies from not threatened to critically endangered; many species threatened by overhunting and habitat loss

ANTELOPE

DID YOU KNOW?

 The oily fur of waterbucks smells so unpleasant that most predators leave them alone!

 European hunters killed so many bluebuck that the species went extinct about 200 years ago.

 The impala has the greatest range of any grazing antelope.

live far from water and they depend on a year-round supply of fresh, green vegetation. Their coats are oily and they have a strong, musky scent. Only males have horns, which are short and curved.

The next tribe, Alcelaphini, are savanna specialists. They live on the vast grassy plains that cover more land than any other habitat south of the Sahara desert. Most members of this tribe are large, with a heavy head and long, awkward-looking

legs. All members of Alcelaphini have back legs shorter than the front legs, so the back slopes down from the shoulders to the rump. The horns usually curve first in one direction then another. Species include wildebeests, hartebeests, bonteboks, topis, and hirolas. The impala is the odd one out in this group. It is smaller and less clumsy looking, and has a more varied diet. Impalas eat the leaves and shoots of trees and shrubs as well as grass.



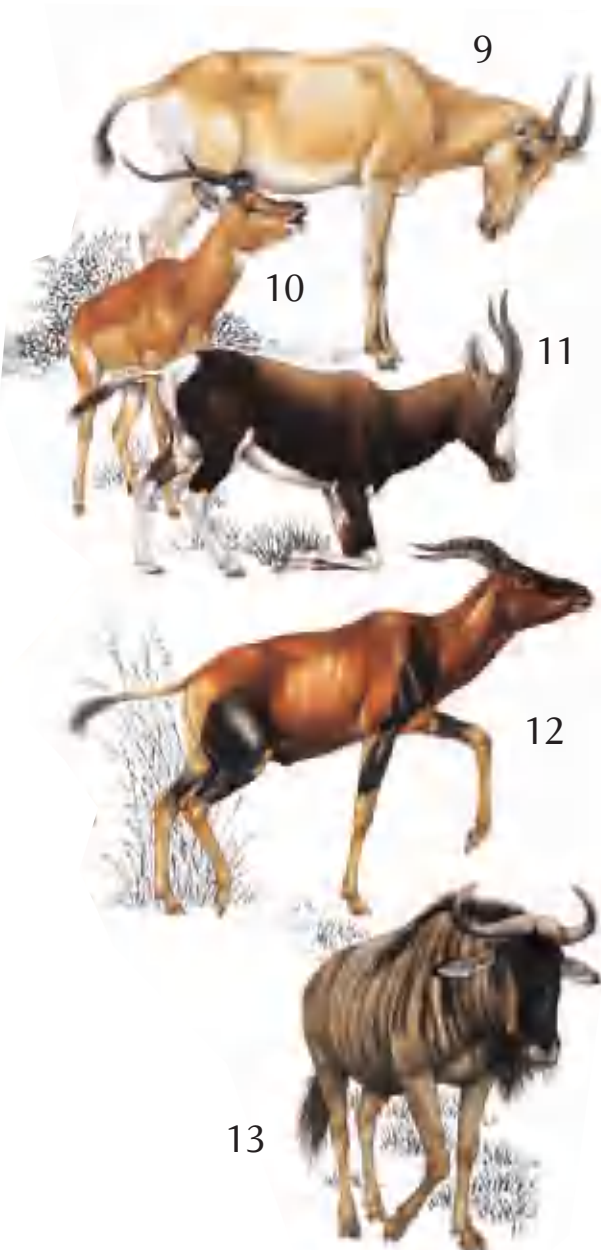


The third tribe is called Hippotragini. These antelope are all large and heavy. They live in small groups spread out over huge areas of dry grassland and desert in Africa and Arabia. Life is hard



GREAT JOURNEYS

Antelope that live in very large herds, such as the wildebeest of southern and eastern Africa (above) and white-eared kob in the Sudan are constantly on the move in search of fresh food. Several species make regular long journeys, following the rains that allow fresh grass to grow. These long journeys are called migrations.



1. Southern reedbuck.
2. Defassa waterbuck, in the dominance display.
3. Roan antelope, in a submissive posture.
4. Sable antelope, presenting its horns.
5. Gray rhebok, in the alert posture.
6. Uganda kob, in the head-high posture.
7. Addax, sampling the air.
8. Gemsbok, kicking out its foreleg during courtship.
9. Coke's hartebeest, with its head held low.
10. Male impala, roaring during the mating season.
11. Male bontebok, kneeling.
12. Topi, in head-up posture.
13. Blue wildebeest, in ears-down courtship posture.

ANTELOPE

for these animals and they cannot afford to be fussy eaters. They have the most varied diet of any grazing antelope. As well as grass, they eat seed pods, roots, tubers, and fruit, especially wild melons, which contain precious water. Food is nearly always in short supply, and these antelope may have to fight for it.



A SPECIES ON THE EDGE

The Arabian oryx is one of the world's rarest mammals. In 1972, there were so few left in the wild that conservationists decided to take them all into captivity. In zoos they were protected from poachers, and their numbers increased to several hundred. Since 1982, small herds have been returned to wild or semiwild habitats in Saudi Arabia, Oman, Jordan, and Israel.

Both sexes have long horns. The horns are straight in the gemsbok, curved in the oryx, and gently spiraling in the addax. The addax is a real desert specialist: it is the only large antelope to survive in the Sahara desert. One species, called the Arabian oryx, lives in Arabia. It is the only member of the family to live outside Africa.

Hunted Herds

Most antelope are hunted by other animals, including people. Lions, leopards, cheetahs, hyenas, wild dogs, and jackals are all a threat. Each species has evolved a way of dealing with predators. Most of the larger antelope species live in large herds. Living in a herd is safer than living alone out on the open plain. It is very difficult for a predator to sneak up on a herd. It will be seen, heard, or scented and once the alarm is raised, the whole herd is on the alert.

Predators usually look for young, old, or weak antelope that cannot keep up with the herd. Healthy and strong antelope do not often get caught. Large herds often include more than one species. Kobs and lechwes often herd together, and wildebeest often herd with zebras.







Herds of some antelope can be very large. Wildebeest form some of the largest herds of any living mammal. When rains encourage fresh grass to grow, wildebeest can gather from miles around to form superherds containing millions of animals.

However, for smaller species like reedbucks, hiding is the best way of avoiding predators. Reedbucks live in small groups that disappear among the reeds and tall grass. Small groups are also the only way desert-dwelling

oryxes and addax can survive. Large herds would starve in their hostile habitat, so these animals live in small groups of five to twenty-five animals.

DID YOU KNOW?

-  The horns of the oryx can grow up to 27 inches long!
-  A migrating wildebeest herd can stretch for several miles!
-  The smallest grazing antelope is the mountain reedbuck, while the largest is the roan antelope.

 A female waterbuck rests, while her two fawns stand close by. As their name suggests, waterbuck live mainly in reedbeds and wetlands.

ARMADILLOS

Where to place armadillos in the mammal family tree has puzzled zoologists for centuries. Early naturalists thought they might be related to turtles because of their bony carapace, or shield. These days, armadillos are placed in an order of their own.





Armadillos look like animals from science fiction. Most of the body is encased in a suit of armor, called a carapace, which is made of bony plates covered in very tough skin. The carapace protects the animal from sharp thorns and from predators. The plates are arranged so the animal can bend its body, and some species can roll up into a tight ball.

There are twenty-one species of armadillos, all living in the Americas. In the past there were many more, including some enormous species. One of these had a carapace 10 feet long. Little is known about most of these species. Most of what is known about armadillos comes from studies of the nine-banded armadillo.

Nighttime Hunters

Armadillos are mainly nocturnal, coming out only at night to hunt. They have poor eyesight but good senses of hearing and smell. The sense of smell is important for finding food and communicating with other armadillos. Most species produce scent from glands on the face, feet, and in their rear, which carries information about the animal for other armadillos.

Armadillos are great diggers. They have short, strong front legs and stout claws. They live in burrows they dig themselves; a single armadillo may use as many as twenty burrows in its home range. Most species hunt by digging in soil and leaf litter or by breaking open rotten logs to get to ants and termites inside.

This nine-banded armadillo's bony plates are clearly visible. Armadillos usually live alone, meeting only to mate. Males fight for the right to mate with females.

Fact File

ARMADILLOS

Family: Dasypodidae (21 species)

Order: Cingulata

Where do they live? South America, Central America, and southeastern United States



Habitat: Grasslands, scrublands, deserts, and all types of forests

Size: Head-body length 5–39 inches (12–100 cm); weight 3 ounces–

 132 pounds (80 g–60 kg)

Coat: Belly is hairy, rest of body is covered in bony armor plates, called a carapace

Diet: Ants, termites, and other soil invertebrates, small vertebrates, and carrion (dead animals)

Breeding: Litter size varies with species, from 1 to 12 offspring, born after a gestation of 60 to 120 days

Life span: 8–12 years in the wild; up to 20 years in a zoo

Status: At least half of all species are vulnerable or near threatened

BABOONS AND MACAQUES

This group of Old World primates are the “typical monkeys” of Africa and Asia. Baboons, macaques, and their relatives are agile, sociable, and very smart.





Baboons, macaques, and their close relatives mangabeys and guenons are Old World monkeys. There are seventy-four species. The smallest member of the group is the talapoin, a species of guenon. The largest is the mandrill, a type of baboon.

All of these monkeys usually walk on four limbs. Their front limbs are arms and their front paws are more like hands than feet. They are agile monkeys. Most species have a long tail, and the face is long, similar to a dog's. Usually there is some bare skin on the face and rump. Most species eat mainly fruit, but different species also eat all kinds of other food.

Trooping Together

Baboons, macaques, and their relatives are social monkeys. They live in groups called troops. The members of a troop work together to find food, watch out for predators, protect offspring, and fight battles with other troops. Young monkeys learn how to survive by watching their elders. Some troops live closer together than others. Baboon and drill troops are very close knit. However, living together is not always easy. Squabbles and fights often break out, especially among the largest and strongest members of the troop.

Females usually mate with a male from their own troop. Most females are at least three or four years old before they are ready to breed. Just one baby is usually born; twins are unusual. These newborns

Something has caught the attention of these Celebes crested macaques. These monkeys live in the forests of Sulawesi, an Indonesian island in the Indian Ocean.

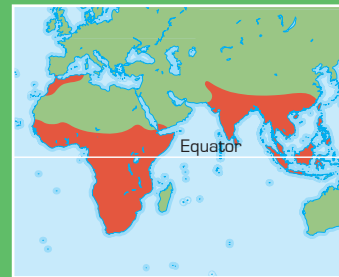
Fact File

BABOONS AND MACAQUES

Family: Cercopithecidae; subfamily Cercopithecinae (74 species)

Order: Primates

Where do they live? Southern Asia, Japan, Indonesia, Africa south of Sahara desert, northwestern Africa



Habitat: Forests, grasslands, scrublands, and mountains

Size: Head-body length 13–28 inches (34–70 cm); weight 1.5–110 pounds (0.7–50 kg)



Coat: Thick, silky fur; males often have a

mane; color varies with species from fawn to black; there may be markings on the face, chest, arms, and legs

Diet: Fruit, seeds, buds, shoots, flowers, bark, gum, roots, bulbs; invertebrates and small vertebrates

Breeding: Most species breed once a year and raise one or two offspring; gestation lasts 5–6 months

Life span: 20–31 years

Status: Varies from very common to rare; many species are threatened by habitat loss



BABOONS AND MACAQUES

have different colored fur than their parents, so they always stand out.


Baboons, mangabeys, and guenons live only in Africa. True baboons are savanna dwellers, but the gelada lives in the highlands of Ethiopia. Drills and mandrills live in the dense forests of west-central Africa. Baboon troops are well organized, with strict rules. Females lead the troop in search of food each day. The strongest males often fight each other for top ranking and the right to mate with females.


The nine species of mangabeys live mainly in forests. Most have long fur and tufts or a ruff of fur around the face. All mangabeys have a long tail. Some species live on the ground, while others live in the trees. That means they do not usually compete for the same types of food.

High and Low


Guenons are typical monkeys. They have short fur, long slim arms and legs, nimble fingers and a very long



 Unlike most monkeys, which live in the trees, the Patas monkey spends most of its time on the ground.

 An olive baboon from the highlands of eastern Africa has captured a rabbit.



 An aggressive stare from this rhesus macaque tells other macaques to stay away.





COLORFUL CHARACTERS

In baboons, mangabeys, and macaques, the bare skin of the face and rump might be very colorful. The colors are brightest in the breeding season. The male mandrill (right) has the brightest colors of any monkey. His snout and his rump are bright red and blue. Females that are in season often have a very swollen rump, which tells males they are ready to mate.



tail. They live high in the trees or on the ground, and they eat leaves. Vervets are the most widespread guenons. They live throughout Africa south of the Sahara desert. Most vervets are tree dwellers, but the largest, the Patas monkey spends most of its time on the ground. The tiny talapoin is a guenon, too. They live in the wet forests of west-central Africa. They eat mainly leaves but sometimes dive into pools for fish.

Mostly Asian Macaques

Macaques live mostly in Asia. There are twenty-one species, including the Rhesus monkey, which has become famous as a laboratory animal used for testing medicines and other experiments. Each macaque species has its own niche—a lifestyle

particular to that species. Since each species of macaque has its own niche, different species do not compete for food or habitat.

The Barbary macaque is unusual. It is the only monkey living in northern Africa. There is a single colony of wild Barbary macaques in Europe, too, on the rock of Gibraltar. Barbary macaques have no tail and are sometimes called Barbary apes. Japanese macaques live farther north than any other wild primate except people. They have thick fur that helps them survive cold, snowy winters. They are very intelligent. Many of these Old World monkeys live close to humans. People find their playful habits funny to watch, but monkeys can also be a nuisance. They raid garbage, steal food, and damage crops.

DID YOU KNOW?

-  The gelada baboon is the only primate that just eats grass!
-  A large mandrill can weigh as much as seventy talapoin monkeys!
-  Japanese macaques in northern Japan bathe in volcanic hot springs to keep warm in winter!

BADGERS

These boldly patterned relatives of weasels and otters are well known as stout, powerful animals born to dig. However, the ancestors of modern badgers were small, bushy-tailed tree climbers.





Most badgers are superb diggers. They have short, powerful legs and large, strong claws. The American badger can bury itself in less than a minute. Yet the badgers' ancestors were better at climbing than digging. Four species of Asian ferret badgers still climb a lot. Most badgers live alone, but European badgers live in groups that share a large burrow system called a set. These sets are used by generations of badgers and can be enormous, with dozens of entrances and up to half a mile of tunnels.

All badgers have bold stripy markings on their head or body. No one knows exactly why. The stripes might help badgers see each other in the dark or might warn off potential predators. Badgers can be fierce, especially when cornered. They fight using their claws, teeth, and enormously powerful jaws. The African honey badger attacks almost anything that comes close.

Badger Diets

Most badger species eat many different foods. Often, badgers living in a particular area eat just a few types of food. In Africa, the honey badger, or ratel, often works with a little bird called a honey guide. The bird leads the honey badger to a bees' nest using a special song. After the badger has opened the nest and eaten the honey, the honeyguide feasts on the leftover bee grubs and wax. American badgers are hunters; they dig up gophers and ground squirrels and eat them.

The American badger is built for digging. It has strong, sturdy forelegs and heavily clawed paws that help it burrow in the soil and dig up prey.

Fact File

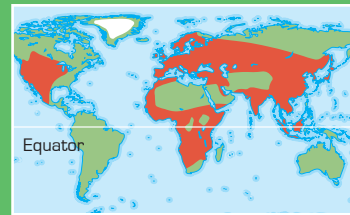
BADGERS

Family: Mustelidae; subfamily: Mustelinae (10 species)

Order: Carnivora

Where do they live? Africa, Europe, Asia, and North America

Habitat: Woodlands, forests, sometimes in mountainous or plains country, parks, and backyards



Size: Head-body length 20–39 inches (50–100 cm); weight 4.5–26 pounds (2–12 kg)



Coat: Looks gray or brown but made up of differently colored hairs; bold black stripes on the face or back, or both

Diet: Insects, earthworms, fruit, and vegetables

Breeding: Litters of 1–6 offspring, born after pregnancy of 3.5–12 months

Life span: Up to 25 years in a zoo; less in the wild

Status: Most species are stable, although some face local threats; Bornean ferret badger is vulnerable

BATS

These amazing animals are the only mammals that can truly fly. That ability has made them one of the most successful mammal groups; about a quarter of all mammal species are bats.

The smallest bat is the hog-nosed bat, with a body the size of a bumblebee. The largest is a flying fox, with a wingspan as wide as a man is tall. Bats live on all continents except Antarctica, in all types of habitats. They are active mainly at night.

Bats are the only group of mammals able to fly. Other groups, such as flying squirrels, are only gliders, and humans can take to the air only with the aid of technology.

Bats rest, or roost, hanging upside down from their toes on branches, rafters, or rock edges. They cannot stand up on their legs as most other mammals do, but a few bats can crawl on all fours.

Numerous Bats

There are more than 1,110 species of bats, which can be split roughly into two groups: around 200 species of large, fruit-eating flying foxes and around 900 species of small microbats. Most microbats eat insects. Some bats catch



Fact File

BATS

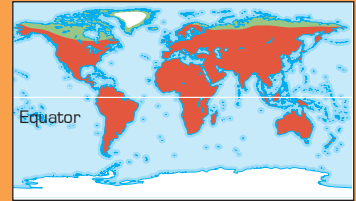
Order: Chiroptera

Families: 18 families

Species: More than 1,110 species

Where do they

live? Worldwide, except in oceans, the highest mountains, and polar areas



Habitat: Almost all land habitats

Size: Wingspan 6 inches–5 feet 6 inches (16–170 cm); weight 0.07 ounce–2 pound 14 ounces (2–1,300 g)

Coat: Short or shaggy, usually very soft; color varies from near white to black, through all shades of gray and brown

Diet: Most species eat insects, some eat fruit, nectar, and fish, a few are predatory, and vampire bats lap blood from wounds

Breeding: Breeding habits vary




Life span: Most species around 10 years; some live up to 33 years

Status: About 250 species are threatened with extinction



1. Lesser mouse-tailed bat
2. Bate's slit-faced bat
3. Hog-nosed bat
4. Thumbless bat
5. Yellow-winged bat
6. Noctule
7. Davy's naked-backed bat
8. Mexican funnel-eared bat
9. Peter's disk-winged bat
10. New Zealand lesser short-tailed bat

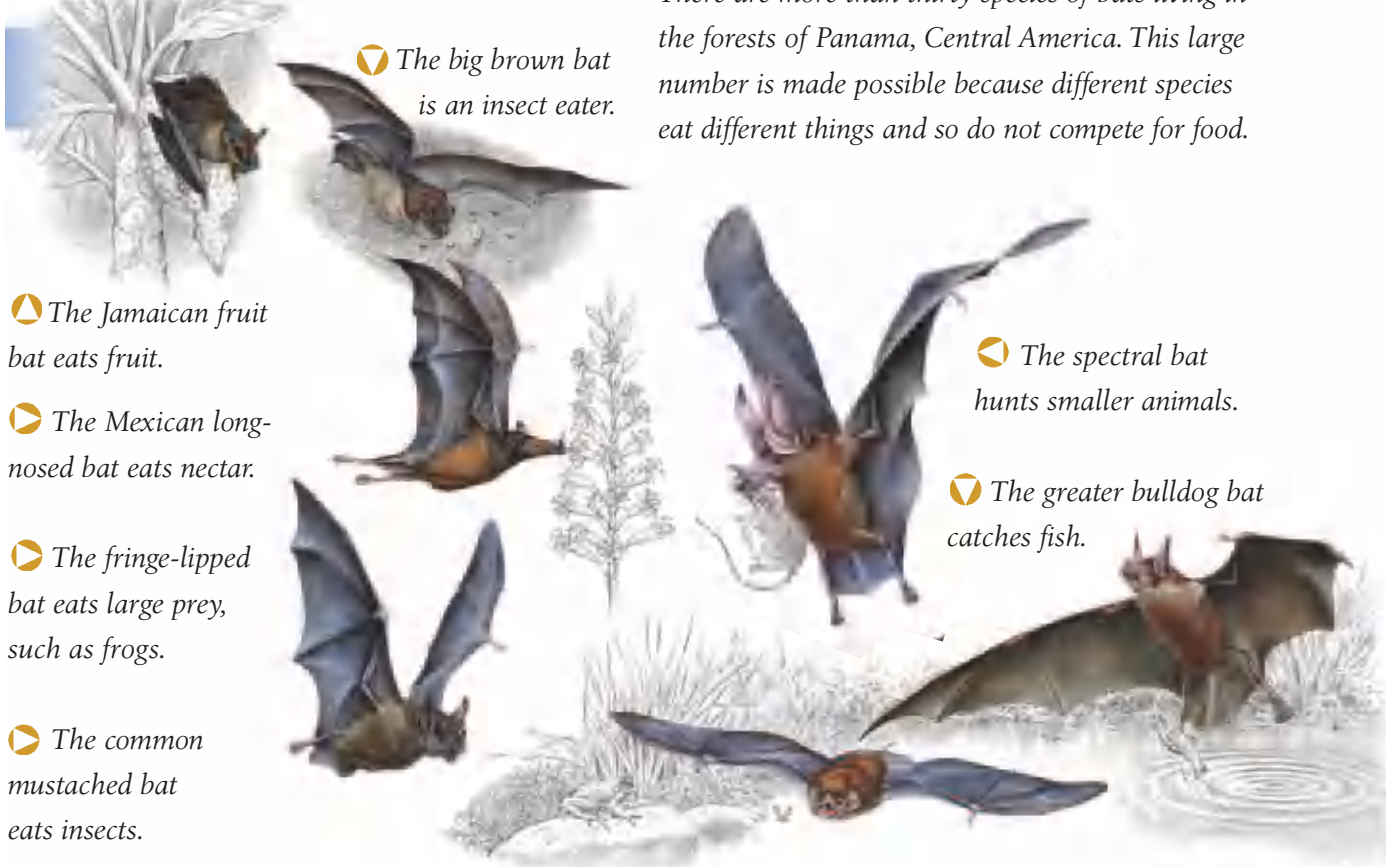
DID YOU KNOW?


-  In Texas there is a colony of Mexican free-tailed bats with almost twenty million members!
-  The fastest bats can fly at more than 30 miles per hour!
-  The hog-nosed bat is the smallest bat in the world and it also has the smallest body of any mammal.


insects on the wing, which is called hawking. Others swoop down to grab insects off leaves, tree trunks, or other surfaces, a process called gleaning. A few bats have unusual feeding habits. Tiny blossom bats use their long tongue to collect nectar from flowers. Bulldog bats catch fish from the surface of pools. Vampire bats are attracted to large animals, such as cattle. They use razor sharp teeth to make a small cut in the skin and then lap up the blood that seeps out.


THE BATS OF PANAMA


There are more than thirty species of bats living in the forests of Panama, Central America. This large number is made possible because different species eat different things and so do not compete for food.





 *The big brown bat is an insect eater.*


 *The Jamaican fruit bat eats fruit.*

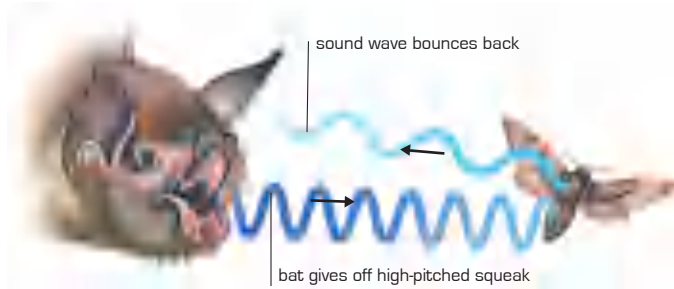
 *The Mexican long-nosed bat eats nectar.*

 *The fringe-lipped bat eats large prey, such as frogs.*

 *The common mustached bat eats insects.*

 *The spectral bat hunts smaller animals.*

 *The greater bulldog bat catches fish.*



🕒 A bat gives off a high-pitched squeak. It bounces off a flying insect, back to the bat. Using this process of echolocation, the bat can figure out exactly where the insect is in the dark and how large it is.

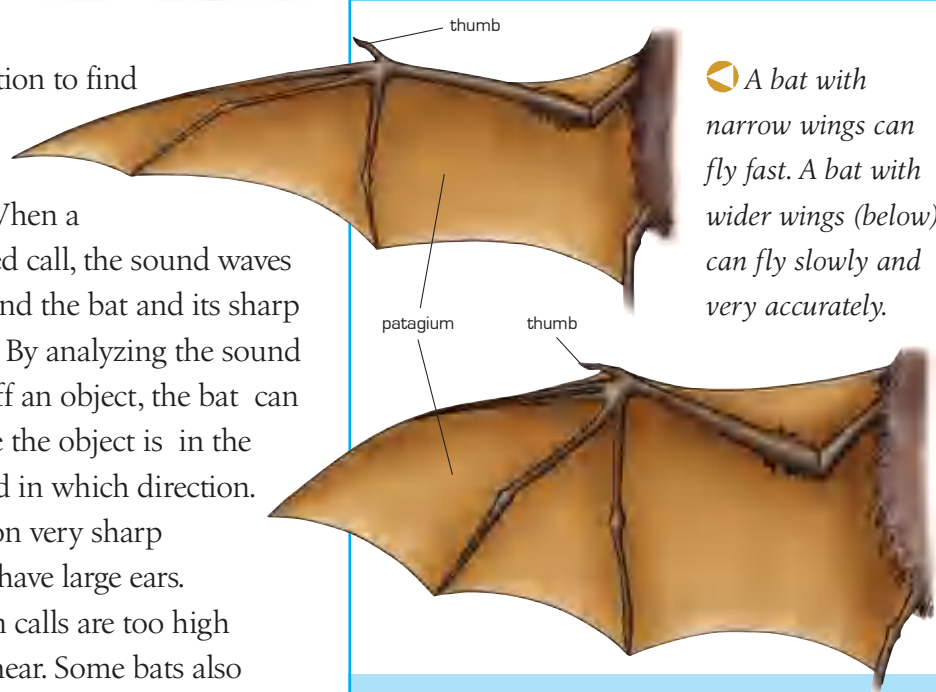
Echolocation

Most bats use echolocation to find their way around in the dark. Echolocation works a bit like radar. When a bat makes a high-pitched call, the sound waves bounce off objects around the bat and its sharp ears pick up the echoes. By analyzing the sound waves bouncing back off an object, the bat can figure out exactly where the object is in the dark, how large it is, and in which direction. Echolocation depends on very sharp hearing, and most bats have large ears.

Most bat echolocation calls are too high pitched for humans to hear. Some bats also use echolocation to find food. Flying foxes do not use echolocation. They feed on fruit and flowers, which they find using sharp eyesight and a very good sense of smell.

Hibernation

In places where winters are long and cold, many bats cannot find enough food in winter. To save energy, they hibernate. Hibernation is like a deep sleep. The bat becomes still, its body becomes cold, and its heartbeat slows down. This state uses so little energy that the bat can survive until spring without food.



🕒 A bat with narrow wings can fly fast. A bat with wider wings (below) can fly slowly and very accurately.

HANDY WINGS

A bat's wings are like spindly arms with huge hands and very long fingers. The "thumb" is free and has a hooked claw, which the bat uses for grooming or hanging onto perches. The other four fingers spread out to support the wing, like the spokes of an umbrella. The thin skin that makes the wing is called the patagium. In many bats, the patagium also connects the wings to the tail.

ISLAND LIFE

Bats are the only mammals to live naturally on many islands, including New Zealand, Hawaii, Mauritius, and the Seychelles. Their ancestors flew there millions of years ago, and for thousands of years the bats had the islands to themselves. Then humans arrived. They began using the land for farming and introduced other mammals, such as cats and rats. Many island bats are now endangered. The rarest bat in the world is the Seychelles sheath-tailed bat. There are probably fewer than fifty individuals left alive.



▲ *Silhouette Island in the Seychelles is now the only place where the critically endangered Seychelles sheath-tailed bat lives.*



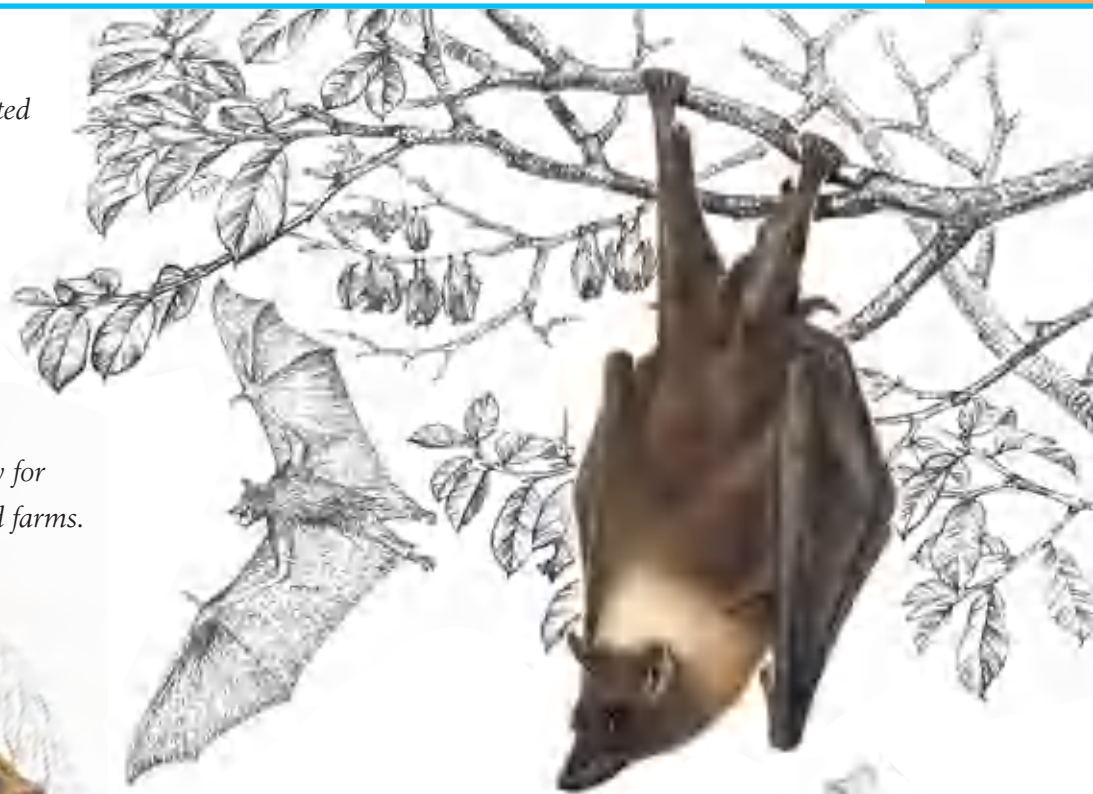
▲ *Pipistrelles are the smallest European bats. They also live in southwestern Asia, Korea, Japan, Kashmir (India/Pakistan), and Morocco (Africa).*

Upside-down Births

Most bats raise only one baby at a time, but a few species have two, three, or four offspring. Female bats give birth while hanging upside down, catching and cradling the baby in their wings. They cannot fly and hold the baby bat at the same time, so the babies are left in nursery roosts while the mothers go out to feed. Bats roost, hibernate, and rear offspring in groups called colonies. While the mother is away, some species of baby bats may be cared for by other bats in the colony.

Many bats are endangered, and some may soon be extinct. People kill bats for food or to protect crops, or because they are scared of them. Many of the places where bats live, such as caves and forests, are being destroyed for farming or building. Most people now realize that bats will not hurt them. Bats are fascinating mammals and they deserve to be protected.

📍 The sucker-footed bat is restricted to Madagascar, an island off the eastern coast of Africa. The forests where it lives are being cut down to make way for people's homes and farms.






📍 The Ryukyu flying fox lives only on the Ryukyu Islands at Japan's southern tip. This endangered bat is hunted for its meat and is further threatened by the felling of trees on which it feeds and roosts.



📍 The gray bat lives in the southeastern United States. It is at risk because the caves where it hibernates are being disturbed by people.



DID YOU KNOW?

-  Children have sharper ears than adults and can sometimes hear high-pitched bat calls!
-  The oldest known bat was discovered in a fossil from Wyoming. It lived fifty million years ago!
-  Bats are not blind. Flying foxes in particular have very good eyesight.

BEARS

Bears are powerful and sometimes fierce animals. They are the largest land-based hunters on Earth. However, they have a gentle side, too. Most bears are just as happy eating nuts and berries, and female bears are among the most devoted mothers.

There are eight species of bears. All bears are large, powerful mammals with a long snout, a heavy muscular body, a short tail, and wide feet. There are five toes and five long claws on each foot. All bears except the polar bear and the American brown bear are good climbers.

Bears evolved from raccoonlike ancestors in the northern hemisphere. Bears still live in northern regions, with only the Andean bear and the sun bear living south of the equator. The Andean bear is also known as the spectacled bear because of the pale markings around its eyes. It is small by bear standards but still one of the largest land mammals in South America. The spectacled bear lives in forests, mountain grasslands, and deserts.

Sun bears live in the tropical southeastern corner of Asia and on Malaysian and Indonesian islands. They have the shortest, neatest coat of any bear. Their coat is black with a pale mark on the

▶ A sloth bear uses its long, curved claws and flexible snout to find insects and grubs.



▶ An Andean bear, or spectacled bear, climbs a tree in search of fruit.



▶ The Asian black bear feeds mainly on plants but may, as here, eat carrion (dead animals).





▲ *The long, curved claws of this sloth bear are clearly visible. Sloth bears live in India, have extremely shaggy coats, and are active at night.*

chest. The sloth bear is another tropical species, native to India and the Himalayas. It has a very shaggy black coat with a white mark on its chest. Its snout is long and has no fur.

Black bears living in Asia look similar to American black bears, but they are far less common. Asian black bears are threatened by poachers who hunt them for body parts, such as their bones and gallbladder, to be used in traditional Chinese medicine.

Anything Goes for Omnivores

Bears evolved from ancestors that ate meat, but bears now eat all types of different food. Bears are called omnivores. Other animals,

Fact File

BEARS

Family: Ursidae (8 species)

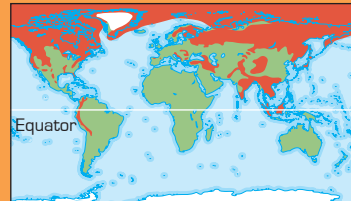
Order: Carnivora

Where do they live? Europe,

Southeast Asia, northern and wilderness areas of

North America, the

Andes mountains, and the Arctic Ocean



Habitat: Mostly forested or lightly wooded areas, tundra, and sea ice

Size: Head-body length 3 feet 7 inches–9 feet 3 inches (110–280 cm); weight 60–1,600 pounds (27–725 g)

Coat: Thick and shaggy in most species; can be plain or with markings on face, chest, and body; color may be black, brown, cinnamon, blonde, or white

Diet: Varies with species; may include fruit, nuts, and other plant matter, honey, insects, fish, large and small mammals, carrion, and garbage

Breeding: 1–6 cubs in a litter, born after gestation of 6–9 months

Life span: Varies with species, from mid-20s to 37 years in the wild; 43 years in zoos

Status: 6 of 8 species are threatened or have endangered local populations

DID YOU KNOW?




The largest bears are grizzlies, or brown bears, that live on Kodiak Island in Alaska. They grow huge on a rich diet of fish!



Toy teddy bears are named after U.S. President Theodore “Teddy” Roosevelt, who refused to shoot a captured black bear on a hunting trip.



such as badgers and foxes, are also omnivores. Most bears eat a lot of fruits, nuts, and leaves as well as fish and meat. Even the fearsome, meat-eating polar bear sometimes eats berries in summer. Sun bears and sloth bears especially like bees and termites. The sun bear has huge canine teeth for breaking open insect nests in dead wood. The sloth bear has a gap where its two upper front teeth should be, and its lips are highly flexible. These features help the sloth bear suck up hundreds of termites at a time.

 *A giant panda makes its way through a forest, looking for bamboo, the only item on its diet.*

The giant panda is unusual because it eats only bamboo leaves. Adult male brown and polar bears sometimes kill and eat bear cubs.

To Sleep or Not

Bears need to eat a lot of food. In northern countries, food can be hard to find in winter, and the bears are in danger of starving to

death. To save energy, the bears enter a winter den and spend most of the winter in a deep sleep called hibernation. Some bears hibernate for six months or more. In tropical countries, there is no long winter and there is plenty of food all year round. Sun bears, sloth bears, Andean bears, and black bears living in these places do not need a long winter sleep.

Winter Births

Brown, black, and polar bear females give birth to their tiny cubs in midwinter. The cubs spend their first few months in the den with their sleeping mother. They live off her milk. In spring, the mother and cubs come out of the den and begin searching for food. The mother bear is very hungry and thin. She has to find food quickly if she and her cubs are to survive. Most cubs stay with their mother for two to three years.



BEWARE THE BEARS



▲ A hunter takes careful aim. Thousands of bears are shot worldwide every year.

It is best to stay far away from bears because they are among the few wild animals that regularly kill or hurt people. More than 100 people a year are attacked and injured by bears, but only a few people are killed. Most of these attacks are by Indian sloth bears, with just a handful of brown, grizzly, and polar bear attacks. However, people are dangerous to bears, too—thousands of bears are killed every year through fear or for sport or profit.

◉ Polar bears mostly live alone, except for breeding pairs and mothers with cubs. The largest of the bear species, an adult male polar bear can measure up to 8 feet 4 inches long and weigh up to 1,320 pounds.

BEAVERS

Beavers are among nature's greatest engineers. Their lodges, dams, and lagoons are built with precision and skill that rivals that of human builders, and they are able to change whole landscapes in the space of a few seasons.





Beavers are rodents. They are cousins of rats, mice, cavies, and squirrels. Like all rodents, beavers have powerful jaws and two sharp front teeth called incisors in each jaw. In beavers, these incisors are big and yellow. They are shaped like chisels and their edges are razor sharp. A beaver can bite through wood and fell large trees using its incisors.

There are two species of true beavers, which look alike—the American beaver and the Eurasian beaver. A third species called the mountain beaver is not a true beaver (see box overleaf). True beavers have short legs and large feet with large claws. The toes on the back feet are webbed like a duck's. A beaver's tail is flat and oval shaped. It is covered in scaly skin but has no fur. On land, beavers walk with a clumsy waddle, but they are wonderful swimmers. Their back feet and flat tail act as powerful paddles. The tail also makes a perfect rudder for steering. When a beaver dives, it can hold its breath for several minutes, its nostrils and ears close tight, and a see-through eyelid protects its eyes.

Beaver Lodges

Beavers often nest in a lodge built in the middle of a shallow pool. The lodge is made of poles, sticks, and branches cut from nearby trees. The entrance to the lodge is underwater. Inside the lodge the beavers are safe from predators, such as wolves and lynx. If there is no pool of water to build a lodge in, beavers make one

A beaver sits among the lush grass in a meadow. The long, straight, silky hairs of its outer coat are greasy and provide a waterproof layer.

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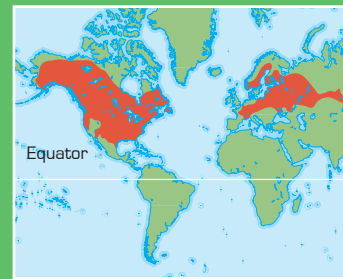
BEAVERS

Castor fiber* and *Castor canadensis

Family: Castoridae

Order: Rodentia

Where do they live? North America, and western and central Eurasia



Habitat: Rivers, streams, lakes, and wetlands

Size: Head-body length 32–47 inches (80–120 cm); weight 24–66 pounds (11–30 kg)



Coat: Silky golden or reddish brown to black outer layer with thick gray underfur

Diet: Wood, grass, and roots

Breeding: Litters of 1–8 (usually 2 or 3) kits, born after 14–15 weeks' gestation; weaned at 8 weeks

Life span: 10–15 years

Status: Lower risk, near threatened; both species almost became extinct owing to fur hunters. Beavers are now protected and starting to recover.



BEAVERS

by building a dam of wood and mud across a small river or stream.

In summer, beavers eat mainly fresh green leaves and shoots. In the fall, these are hard to find, so beavers eat the soft wood under the bark of trees such as aspen, willow, and birch. They often store lots of wood underwater so that they can reach it from the lodge without having to go ashore. The beavers can still reach their larder when the pool is frozen.

Family Groups

Beavers live in family groups, like people. Each family group contains an adult male and female and their offspring. Young beavers are usually born in litters of two to four, but sometimes more. They stay with their parents for around two years. When

DID YOU KNOW?



A beaver can cut down a tree with a trunk up to 40 inches thick with its teeth!




Beavers are the second heaviest rodents after the capybara of South America!



A beaver's teeth never stop growing out of its gums; they just get worn down at the tips!

they are old enough, they start to help collect food, repair the lodge and dam, and look after their new baby brothers and sisters. By the time they leave the family to find a mate of their own, young beavers have

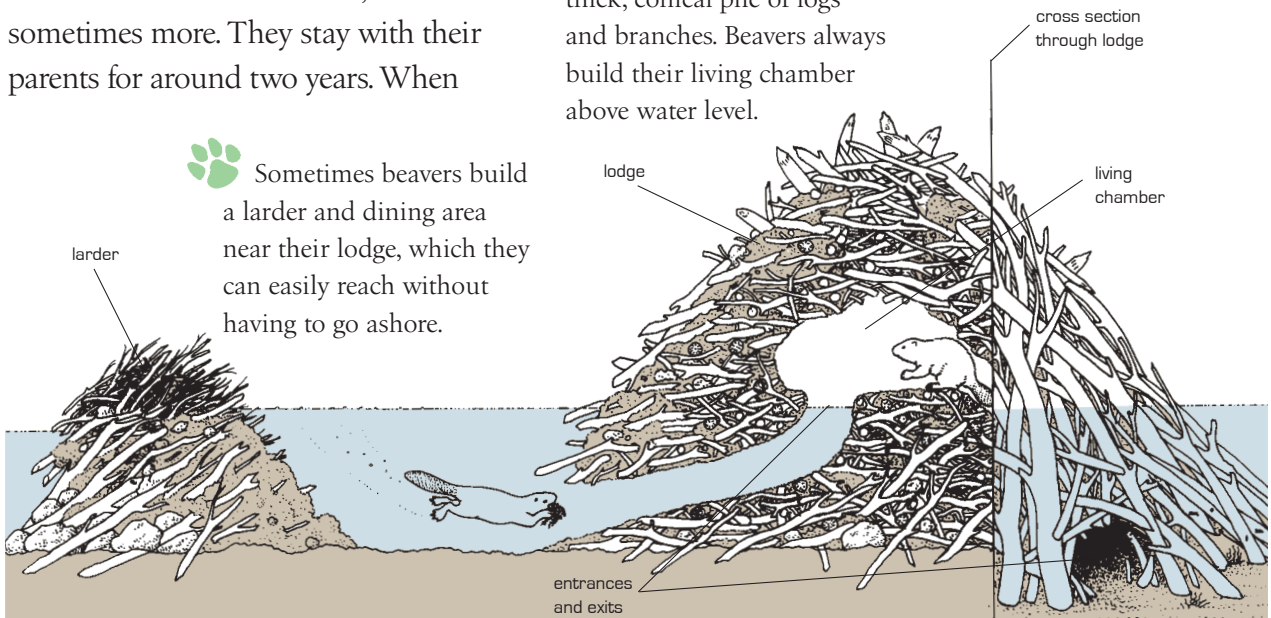
 A cross section through a beaver's lodge reveals how the beavers have built it from logs and branches.



A beaver's lodge is a large, thick, conical pile of logs and branches. Beavers always build their living chamber above water level.



Sometimes beavers build a larder and dining area near their lodge, which they can easily reach without having to go ashore.





learned all the important skills they need to survive and breed, such as building lodges and caring for babies.

Beaver Fur and Hunters

Beaver fur is thick. On the outside is a thick layer of long, straight, silky hairs. These hairs are greasy and act like a waterproof coat. Beneath this layer and next to the skin is a layer of fine, soft hairs that keep the beaver warm even in icy water.

Beaver skins make warm waterproof clothing and hats for people, and were once extremely valuable. Millions of beavers were trapped in Europe and America for their fur, meat, and for a smelly substance called castoreum (from glands in their rear). People have used castoreum for thousands of years to treat many illnesses. It contains a chemical similar to aspirin, which comes from the bark of willow trees. Beavers eat willow trees.

In the mid-eighteenth century, the French fought a terrible war against Native Americans over land where beavers were once common. Beavers nearly became extinct. Hunting is now controlled. The American beaver is no longer threatened, but the European beaver is still rare.



MOUNTAIN BEAVERS

The mountain beaver is not a true beaver. It belongs to a separate family (group) of rodents called Aplodontidae. Mountain beavers look a little like true beavers, but they are less than half the size and do not have a flat tail. They live in the cool coniferous forests of the Rocky Mountains, along the Pacific coast. Mountain beavers dig large, complicated burrows with lots of tunnels, chambers, and entrances. They are seldom seen in the wild because they spend much of their time in their burrows. They eat leaves, roots, and shoots and can be a nuisance in plantations, where they nibble young trees.

BELUGA AND NARWHAL

**Belugas are sometimes called white whales.
Both the unusual narwhal, with its tusk like a mythical unicorn's horn, and the noisy beluga belong to the same small family (group) of toothed whales.**





Narwhals and belugas are toothed whales, just as dolphins and sperm whales are. Belugas have thirty-two to forty teeth, but the narwhal has only two, both in the upper jaw. In male narwhals, the tooth on the left grows into an amazing spiral tusk up to 10 feet long. Males use their tusk for fighting and showing off.

Both these whales have a very thick layer of fat, called blubber, under their skin. The blubber helps them stay warm in the nearly freezing water. Healthy belugas can be so fat that their head looks too small for their body. Both whale species eat a lot of food. Belugas usually hunt close to the seabed for fish and shellfish. Narwhals hunt in very deep water for fish and soft invertebrates, such as squid, which they suck up and swallow whole because they have no teeth for chewing.

Whale Pods

Belugas and narwhals spend most of the year far out to sea, but large groups might move close to shore in summer. Within these groups are lots of smaller groups called pods. Pods come and go, so the large groups do not always have the same members. Some pods contain just males, others contain females with their offspring. Baby belugas and narwhals stay close to their mother. She produces milk for them for two or more years. In summer, belugas molt (shed) their skin. They gather in river mouths, close to melting glaciers, where freshwater helps the old skin loosen.

Belugas use lots of different calls, such as whistles, coos, clicks, and warbles. They also make faces to communicate and have many muscles in their face.

Fact File

BELUGA AND NARWHAL

***Delphinapterus leucas* (beluga) and *Monodon monoceros* (narwhal)**

Family: Monodontidae

Order: Cetacea

Where do they live? Far northern Pacific, Atlantic, and Arctic oceans



Habitat: Cold seas

Size: Head-body length 10 feet–16 feet 6 inches (3–5 m); weight 1,100–3,520 pounds (500–1,600 kg)



Coat: No fur; skin gray in young whales, fading to white in belugas and becoming mottled with white in narwhals

Diet: Fish, shellfish, and worms

Breeding: Single calf born after 14–15 months' gestation

Life span: 30–40 years

Status: Belugas are vulnerable

BROWN BEAR

A brown bear can weigh more than 1,000 pounds, yet it can run as fast as a horse. This bear has bone-crushing jaws and claws longer than a man's finger. Brown bears can be deadly, but most are afraid of people and feed on nuts, berries, and roots.





The brown bear is one of the world's largest meat-eating mammals. It is also one of the most widespread mammals. Brown bears live across the northern hemisphere, from Canada and the United States to Russia, China, Europe, and the Middle East. They were once even more widespread, but brown bears have died out in North Africa, the British Isles, and most of Europe.

Large and Varied

Brown bears from different places are extremely varied. Bears in the far north are larger than those living nearer the equator, for example. Being large is a good way of coping with the cold. However, bears can only grow very large where they can find a lot of good food. Grizzly bears that live alongside salmon rivers in Alaska, and on Kodiak Island, and in Kamchatka in Russia are the largest of all bears, larger even than polar bears.

The brown bears of Europe and the Middle East are a quarter of the size of an average grizzly, however. These European bears have to work harder and roam over a much larger area than the giant grizzlies to find food. Fruit, especially berries, is an important food for brown bears in summer. Brown bears eat nuts in the fall. They also eat roots and vegetables, which they dig up with their powerful front legs and large claws. They can also dig out the burrows of smaller mammals, such as voles and ground squirrels, which they then eat.

The brown bear has a large nose and an excellent sense of smell. When a brown bear's fur is tipped with white or gray, it is often called a grizzly bear.

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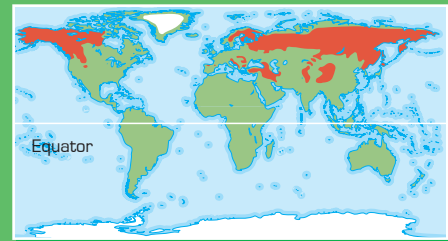
BROWN BEAR

Ursus arctos

Family: Ursidae

Order: Carnivora

Where do they live? Northwestern North America, northern Eurasia, and scattered throughout east Central Europe and Central Asia



Habitat: Forests, green mountainsides, tundra, and dry steppes

Size: Head-body length 4 feet 11 inches–9 feet 2 inches (1.5–2.8 m);

weight 175–1,600 pounds (80–725 kg)



Coat: Thick blonde, brown, or black fur, tipped with white in grizzly bears

Diet: Roots, shoots, fruits, nuts, seeds, insects, fish, and mammals up to the size of large deer

Breeding: Litters of 1–4 cubs born in winter; weaned at 5 months; independent at 2–3 years




Life span: Up to 37 years in the wild; 43 years in a zoo

Status: Some populations of brown bears are endangered



BROWN BEAR


DID YOU KNOW?

-  A hibernating brown bear does not eat, drink, urinate, or defecate for up to six months!
-  A large grizzly bear standing on its hind legs is twice as tall as a man!
-  A hungry brown bear can eat more than a quarter of its body weight in food in one day!

In places with large herds of deer, brown bears may kill and eat a lot of calves, which helps keep deer numbers under control.

Deep Sleep

In winter, brown bears may enter a deep, sleeplike state called hibernation, but not all of them do. Bears hibernate only if

 *A pair of brown bears patrols a riverbank. Salmon swimming upstream are an important part of the diet of brown bears living on the northwestern coast of North America.*



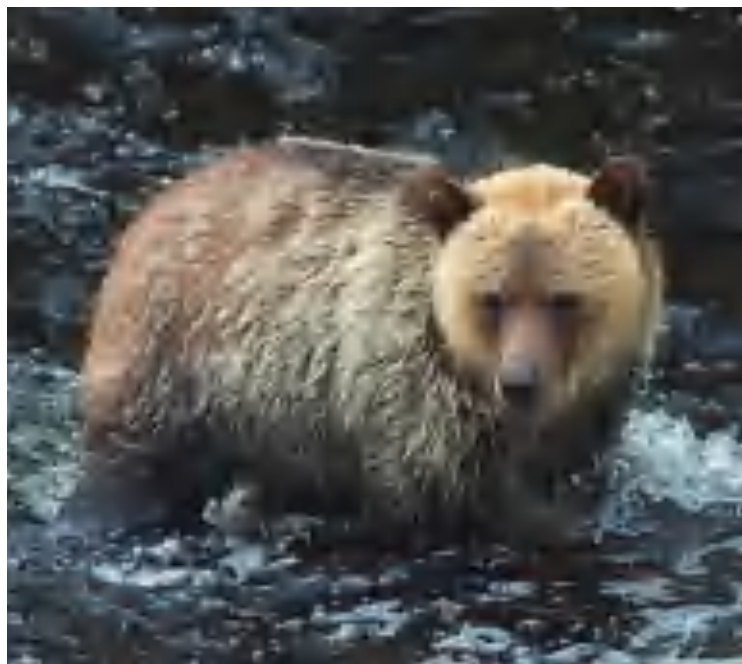


they live in a place where food is plentiful during summer and scarce in winter. In Siberia, Alaska, and northern Canada, brown bears grow fat in summer and fall. When winter comes, they hide away in a den and hibernate. Their heartbeat and breathing rate slow down. However, unlike other hibernating mammals, bears do not allow their body to become cold and they can wake up quickly if danger threatens.

Raising their Cubs

Brown bears live alone, except for mothers and their cubs. Adult male and female bears live apart and only come together to mate. Females with cubs do not let males come near because males often try to kill the cubs. They want the female to raise their cubs, not another male's. When cubs are killed, the mother becomes ready to breed again more quickly.

A female bear can have up to four cubs in a litter but two or three is normal. The cubs are tiny, but they grow fast, feeding on fatty milk from their sleeping mother. All hibernating bears lose a lot of weight, but new mothers lose the most weight because they have to share their fat reserves with their



WHY DO THEY DELAY?

Brown bears can mate at any time in the spring or summer. But females that mate early are pregnant for longer than females that mate later on because the embryos (developing babies) do not begin to grow until the fall. Cubs are always born in the middle of winter, while the female bear is hibernating. By the time the cubs need solid food, it is spring and there are plenty of things available to eat.

cubs. A female bear that weighs 500 pounds in the fall may lose 200 pounds by spring. Her cubs, on the other hand, can increase their weight twenty times in their first three months.

BUSH BABIES

With their furry faces and huge goggle eyes, bush babies and their relatives look rather like cuddly toys or cartoon animals. Bush babies, or galagos, are primates that move around at night.





Bush babies and their close relatives lorises and pottos are small primates that come out only at night. Bush babies, also called galagos, have large, bulging eyes that help them see in the dark. They also have very good hearing and an excellent sense of smell. Females look after their babies with no help from males. Small babies are left in a nest while the mother goes out to feed or they may go with her, riding on her back until they are old enough to climb by themselves.

All bush babies and their relatives live in trees. Their feet and hands have fingernails and toenails instead of claws, but they can still grasp branches tightly. Their agile and sensitive fingers help them catch their insect prey. Only one species, the large angwantibo, ever comes down to the ground. Galagos are nimble and active. They scramble through trees using their long furry tail for balance. Their back legs are longer and stronger than their arms, and galagos use their legs to make large leaps from branch to branch.

Careful, Creeping Lorises

Lorises and pottos move very slowly. They have no tail and creep along branches, carefully moving one hand or foot at a time. When they sense danger, they freeze midstep and stay completely still. They can hold difficult positions for hours. Sometimes, when they are trying to get a good look at something, they bob up and down and swivel their head from side to side.

Bush babies are sometimes called galagos. They live alone and come together only to breed. Bush babies have fingernails and toenails instead of claws.

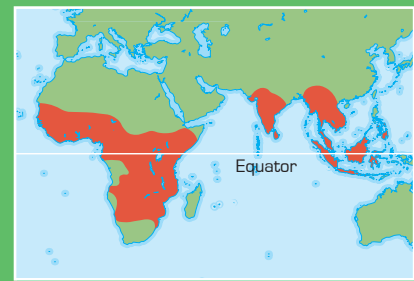
Fact File

BUSH BABIES

Families: Galagidae (18 species) and Lorisidae (9 species)

Order: Primates

Where do they live? Africa south of the Sahara desert, India, Sri Lanka, and Southeast Asia



Habitat: Forests, woodlands, and plantations

Size: Head-body length 4–12 inches (10–30 cm); weight 2–40 ounces (60–1,130 g)



Coat: Fine fur, usually plain fawn, gray, or brown; some species have dark markings on the face

Diet: Fruit, gum, nectar, insects, eggs, and small, tree-dwelling animals

Breeding: Litters of 1 or 2, born after a gestation of 111–197 days

Life span: Up to 26 years

Status: Varies with species; some are common; two species are threatened with extinction; several other species are becoming rare

CAMELS AND LLAMAS

The toughest of the tough—camels and their relatives—can survive heat, drought, cold, and the thin air of high mountain ranges. There are millions of domesticated camels and llamas all over the world, but three of the six species are extinct in the wild.





Camels and their relatives are hooved mammals with long legs and a long neck. They are extremely hardy. Camels survive in hot, dry deserts, and the South American llama, alpaca, guanaco, and vicuña all live on high mountains, where the air is thin and cold and food is hard to find.

There are two species of camels, the dromedary and the Bactrian camel. Both live in deserts. Dromedaries have one hump and soft, wide feet. They are suited to life in hot, sandy deserts such as the Sahara and Arabian deserts. Bactrian camels have two humps. They live in cold, stony deserts, such as the Gobi in Mongolia.

Rare in the Wild

People began keeping camels about 4,000 years ago and now there are millions in captivity. However, they are extremely rare in the wild, with only a few hundred wild Bactrian camels living in China and Mongolia. Dromedaries were taken to Australia more than 100 years ago, when settlers began to explore the central desert. The land was too hot and dry for horses, so camels were used instead. Some of the camels were set free, and their descendants still live there now.

Surviving Deserts

Deserts are very dry. The sun is very hot during the day, but the desert is cold at night. Camels are well suited to life in deserts. At night, they allow their body to cool,

Just like other camels, this camel has thick eyelashes and nostrils that close to stop sand from getting into its eyes and nose. Its thick fur protects it from the sun.

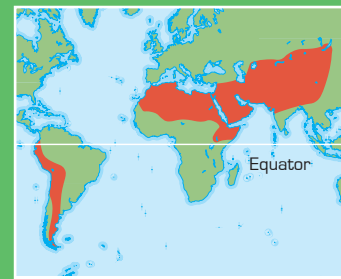
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CAMELS AND LLAMAS

Family: Camelidae (6 species)

Order: Artiodactyla

Where do they live? North Africa, Middle East, southwest and Central Asia, and Andes mountains of South America; introduced to Australia



Habitat: Rocky and sandy deserts, mountain scrublands, and grasslands

Size: Head-body length 4 feet
1 inch–11 feet 4 inches (125–345 cm);
weight 100–
1,450 pounds
(45–560 kg)



Coat: Woolly fleece, short in camels, shaggy in llamas, and very fine in vicuñas; coat ranges from near white to yellow, brown, red, and black; usually plain, sometimes with bold patches in llamas

Diet: Mostly plants

Breeding: Single offspring born after a gestation of 10–16 months

Life span: 10 to 50 years

Status: There are no truly wild llamas, alpacas, or dromedaries; guanacos vulnerable; wild Bactrian camels critically endangered

CAMELS AND LLAMAS

so it takes a long time before they begin to overheat next day. The thick fur on their back helps protect them from the burning sun. Camels also have thick eyelashes and nostrils that close to prevent sand from getting in their eyes and nose.

To save water, camels hardly ever sweat and their urine usually contains very little water. They can live for weeks or months without eating or drinking. When there is plenty of food, camels eat and drink a lot. They eat most plants, even very



1

2



3




4


5




 1 The Bactrian camel has two humps. It lives in Mongolia.

 2 The vicuña, a relative of the camel, lives in the high Andes.

 3 The Arabian camel, or dromedary, has just one hump.

 4 Raised for its wool, the alpaca has long, dark, thick hair.

 5 The llama is used as a pack animal in areas of South America.



► *A herd of Bactrian camels strides out across the Mongolian grasslands. These mammals are critically endangered.*

salty ones. When they are very hungry, camels eat anything, even cloth or the bones of dead animals. Camel humps contain fat. The humps of well-fed camels are large and firm. On a starving camel, the hump is floppy because the animal has used up a lot of this food store.

Herd Life and Harems

In the wild, camels and their relatives live in herds. A strong adult male protects a small group of females, called a harem. He tries to stop other males mating with his females. Female llamas are pregnant for around eleven months; female camels are pregnant for fifteen or sixteen months. Newborn camels and llamas are well developed. They can stand and run soon after birth.

Llamas and alpacas are farmed all over the world for their wool and they are also used as pack animals—they carry heavy loads for people. Only guanacos and vicuñas live truly wild. They have both declined from hunting for their fine wool. However, they are now protected by law.



REALLY USEFUL CAMELS

Camels are extremely useful animals. While they are alive they can be used for riding or carrying heavy loads. They produce milk, and their droppings burn well and can be used for fuel. Their wool can be used to make yarn and matting. When camels are dead, their meat can be eaten, their hide makes fine leather, and their sinews make strong cord.

DID YOU KNOW?



A thirsty camel can drink 26 gallons of water at one time!



The guanaco is the tallest animal in South America.



Vicuña wool is one of the world's most expensive natural fibers. It costs up to \$100 a pound!

CAPYBARA

The South American capybara may look a bit like a furry pig, but it is the world's largest rodent. These giant cousins of cavies live in large groups and never stray far from water.





Capybaras have a sturdy body, square snout, short legs, and no tail. They feed and sleep on land but always stay close to water. Their feet are webbed and capybaras are good swimmers. The nostrils, eyes, and ears are all on the top of the large head, allowing the capybara to breathe, see, and hear when swimming with only the top of its head above the water.

Capybaras live in groups of up to thirty individuals. Each group has one large male, a few adult females and their offspring, and sometimes a few smaller males. Males have an oval bump on the top of the snout, called the morillo. The morillo produces a sticky, white scent. Every capybara has its own smell, by which other capybaras can recognize it. The leading male has the largest morillo and he produces more scent in the breeding season, to attract females and drive away other males. As well as scent, capybaras can communicate with each other using sound. They grunt and purr, and bark when they are frightened.

Caring Capybaras

Capybaras mate in the water. The offspring are born well developed. The females in a group seem to help each other care for the young capybaras, and the whole group helps protect the offspring from predators. If a capybara sees a predator, such as a jaguar or fox, it sounds an alarm and the group gathers together. Often capybaras run into the water and form a tight circle.

Capybaras are furry animals with a large, square snout. Their nostrils, eyes, and ears are positioned in a straight line on the top of their head.

Fact File

CAPYBARA

Hydrochaeris hydrochaeris

Family: Hydrochaeridae

Order: Rodentia

Where do they live? South America



Habitat: Wet grasslands and forests close to pools, lakes, and rivers

Size: Head-body length 24–53 inches
[106–143 cm];
weight 77–146
pounds [35–66 g]



Coat: Light brown, bristly fur

Diet: Grass and water plants

Breeding: Litters of 1 to 8 offspring,
born after 150 days' gestation

Life span: 6 years in the wild; 12 years
in zoos

Status: Lower risk; conservation
dependent



CARNIVORES


Carnivores come in all shapes and sizes, from the giant polar bear and grizzly bear to the tiniest weasel. The name carnivore means “meat eater,” and while many of the group are born hunters, not all are so fearsome, and some carnivores are even vegetarian.

The order (group) Carnivora includes many of the world’s largest and most fearsome predators—the magnificent tiger, gigantic polar bear, cunning hyena, and the feisty wolverine. It also includes a host of very different animals with a much less fearsome reputation—playful otters, sociable meerkats, frisky raccoons, seals and sea lions, and gentle giant pandas.

Carnivore Ancestor

Each of these different mammals have the same ancestor. The ancestor of all carnivores probably lived around sixty million years ago. It belonged to a group of animals called miacids. Miacids have been extinct for millions of years, but their fossils show that they might have looked a little like skunks or raccoons.



 *A Malayan sun bear, or honey bear, licks its lips. These small, tree-climbing bears eat fruit and insects.*

Miacids had short legs and paws that seem to have been suited to climbing trees.

The most important thing about miacids was their teeth. On each side of their upper and lower jaws, two of their cheek teeth had sharp edges that acted like scissor blades. These teeth allowed them to slice up meat into small chunks. So, miacids were much better at





▲ *The banded mongoose lives in Africa south of the Sahara desert. It is related to the meerkat.*

eating meat than other animals whose teeth were made for gnawing, stabbing, and crushing. These slicing teeth are called carnassials. All living carnivores have carnassial teeth, too.

The 283 living species of carnivores are split into fifteen groups called families. Some, such as lions, tigers, and other cats, are solely meat



Fact File

CARNIVORES

Order: Carnivora

Families: 15 families

Species: 283 species

Where do they live? Worldwide, except Antarctica

Habitat: All types of land and watery habitats



Size: Head-body length 6 inches–9 feet 3 inches (15–280 cm); weight 1 ounce–1,600 pounds (30g–725 kg)

Coat: Furry coats that vary greatly

Diet: Meat, fish, and carrion (dead animals); many species also eat plants

Breeding: Varies greatly with species

Life span: 1 year to several decades

Status: Varies with species

eaters. They still have sharp-edged carnassial teeth. Others have more varied diets. Badgers and bears, for example, might eat worms and berries and their carnassial teeth are more suited to crushing than slicing. The giant panda eats only bamboo and its carnassial teeth are suited to grinding.

1. A spotted hyena pack hunts down a zebra.
2. A pampas fox stretches its forelegs.
3. Crabeater seal
4. Leopard seal
5. Southern elephant seal
6. Hawaiian monk seal

Shapes and Sizes

Apart from their teeth, many carnivores do not seem to have much in common. Their bodies come in different shapes and sizes, depending on the food they eat. For example, cats are hunters. They are fast and strong, with long muscular legs, short powerful jaws, and very sharp claws. Dogs are also fast runners, but their claws are not so sharp and cannot be drawn back into their paws. Dogs can use their claws for digging rather than for hooking into prey. A dog's snout is longer than a cat's, making room for a very sensitive nose

for tracking prey. Bears are large, which helps them survive a long time without food and makes them safe from most other predators.

Swimmers, Climbers, and Crunchers

Seals and walruses have legs that have evolved into flippers, making them expert swimmers. They hunt fish and other sea creatures. Otters are also superb swimmers. They cannot dive for as long or as deep as seals, but they have kept their legs and can still move nimbly on land. Civets, genets, raccoons, and coatis are



👉 A wildcat mother looks after her two kittens. Wildcats belong to the family Felidae in the order Carnivora. They prey on small mammals and birds.

👉 A sun bear licks termites from a mound it has broken open. Bears belong to the order Carnivora and the family Ursidae. Sun bears are the smallest bears with the shortest hair. As a result, they are often called dog bears.





👁️ *On the alert, a pair of otters perches on some rocks. These carnivores eat mainly fish but also take frogs, crayfish, crabs, and sometimes birds.*

Sharp Senses

Most carnivores have good eyesight. Many hunt at night and can see in the dark. A special layer at the back of the eyes of many carnivores reflects light, just as a mirror does. This reflection can often be seen when a cat is caught in the beam of a torch or headlight. This layer helps the animal make the most of even very dim light.

Hearing is another important sense for many carnivores. Foxes, genets, and raccoons, for example, all have ears that act like radar dishes, which can turn to focus on small sounds. The bat-eared fox and the serval have really huge ears—they can hear the tiny sounds of small rodents and even worms moving in the ground.

excellent climbers, able to chase prey through trees or collect ripe fruit from the branches. Hyenas have jaws so powerful that they can crunch up the bones and horns of other large animals and get a good meal out of the parts other carnivores leave behind.

OUT ON A LIMB

The red panda is a puzzle. Over the years, scientists have struggled to figure out how it is related to other carnivores. It looks somewhat like a raccoon but it also has features in common with the giant panda, which is a type of bear. These days, the red panda is placed in a family all by itself, called Ailuridae, but its closest relatives remain a mystery.



ISLAND RACE

The island of Madagascar, which lies off the east coast of Africa, is like a giant natural laboratory. It has been separate from the rest of Africa for such a long time that it has evolved lots of unusual animals that do not exist anywhere else. Madagascar even has its own group

of carnivores, including the catlike, tree-climbing fossa and mongooselike hunters such as the falanouc and the fanaloka. Like many other Madagascan animals, these animals are under threat from habitat loss. More than half of them are listed as vulnerable or endangered.

▶ *Falanouc*



▶ *Fanaloka*



▶ *Fossa*



Smells and scents are very important. Most carnivores use scent for hunting. Dogs have the best developed sense of smell and can follow the trail of an animal that passed by days or weeks before. Carnivores also use smell for communicating with each other. They all produce scent of their own. Often this scent is mixed with their urine or feces, but it can also come from glands in the skin. By leaving patches of scent on the ground or on trees and rocks, carnivores mark out their territory or advertise for a mate. The scent carries information about the animal—whether it is male or female, old or young, healthy or sick,

and probably lots of other things that another animal can tell with just one sniff. Some carnivores produce scents so powerful they are used in self defense. The scent of a skunk is so bad that it can drive away a predator.

Life in a Group




Most carnivores spend at least part of their time living in groups, usually family groups. These groups can work together to hunt, raise offspring, and defend a territory. Being part of a group helps these animals survive in places where they might not manage alone. Some carnivores live alone, such as the tiger and the

polar bear. As youngsters, these animals spend a long time with their mother, learning how to survive. Polar bear mothers look after their cubs for around two and a half years.


Extinction Threats

Many carnivores are threatened with extinction. People and wild carnivores do not often mix well. Animals such as tigers, wolves, and bears sometimes attack and kill people. Many more, such as foxes, pumas, and seals, are unpopular because they take prey that people want for themselves, such as fish and livestock. However, killing carnivores out of fear or hate means that many species, such as tigers, are now rare.

DID YOU KNOW?

-  The largest carnivores are the grizzly bear and polar bear. The smallest is the least weasel.
-  A person's best friend, the dog, is the closest relative of one of our worst enemies, the wolf!
-  The carnivore with the largest teeth is the walrus.

Other species, such as the giant panda, are threatened with extinction because people have destroyed so much of their habitat.

 *The meat-eating red fox belongs to the dog family Canidae, within the order Carnivora.*



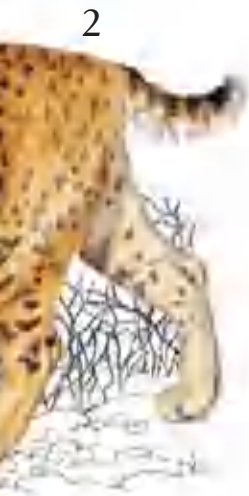
CATS

Stealthy, powerful, and quick, cats are perhaps the ultimate land predators. They eat only meat, and there are few other animal species that are not hunted by a cat of some sort.

Cats are incredibly athletic. They can run, leap, and climb better than almost any group of mammals. The cheetah is the fastest land animal, the tiger can leap 30 feet from a standing start, and smaller cat species have an amazing ability to always land on their feet. Most cats can swim well. Cats are also powerful. Most can bring down smaller prey with a swipe of the paw. All the big cats, such as lions and tigers, can tackle prey larger than themselves. They use their hooked claws and muscular forelegs to latch on and wrestle large deer, antelope, and even buffalo to the ground. By working in a team, lions can even bring down an elephant. Cats are top predators; they kill and eat all sorts of other animals, but there are few other animals that kill and eat cats.

All cats (except cheetahs) have needle-sharp claws that can be drawn back into the paws so they do not snag or go blunt. Cats have pointed canine teeth for stabbing prey and sharp-edged cheek teeth, or carnassials, for slicing meat. Cats have excellent eyesight. Their eyes face forward, which helps them judge distances when they pounce or leap. They have good hearing, too, but their sense of smell is not as good as a dog's.





1. *Lynx*
2. *Bobcat*
3. *Cheetahs*
4. *Tiger*
5. *Leopard*
6. *Jaguar*
7. *Ocelot*
8. *Tiger cat*
9. *Jaguarundi*
10. *European wildcat*
11. *African wildcat*



Fact File

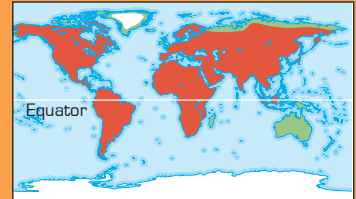
CATS

Family: Felidae (36 species)

Order: Carnivora

Where do they live? Worldwide, except Antarctica and some oceanic islands

Habitat: All types of land habitats



Size: Head-body length 14 inches–10 feet 3 inches [35–310 cm]; weight 2–570 pounds [1–258 kg]

Coat: Fur may be short and neat or thick and luxuriant, plain or strikingly patterned




Diet: Meat of all types and fish

Breeding: 1–6 kittens, born after gestation of 56–120 days

Life span: Up to 26 years in zoos, much less in the wild

Status: All wild cats are facing some threat; many cats are at high risk of extinction

DID YOU KNOW?

-  Snow leopards cope with the widest temperature range of any cat, from 112°F in the summer to –40°F in winter!
-  The smallest cat is the black-footed cat from southern Africa, with a head-body length of around 14–15.5 inches.
-  The extinct saber-toothed cat weighed up to 450 pounds and had canine teeth (fangs) around 7 inches long!



Cats Big and Small

Cats fall into two main groups, big cats and small cats. Big cats include the lion, tiger, leopard, jaguar, snow leopard, clouded leopard, and cheetah. Small cats are the lynx, puma, ocelot, caracal, serval, and around twenty species of small wildcats. The differences between big cats and small cats are not only about size. Most big cats are larger than most small cats, but the puma and most lynxes, which are “small cats,” are all larger than the clouded leopard, which is a “big cat.”

🔺 *Stalking quietly on its large, padded paws, this jaguar shows off its magnificently patterned coat.*

Big cats can roar, but small cats cannot; the part of the throat that vibrates to make a roar is hard and bony in small cats rather than soft and stretchy. Big cats have round pupils in their eyes, while the pupils of small cats close to slits. As a general rule, small cats crouch to eat, while big cats stand or lie down.

Purring is an interesting habit of small cats. Cats purr when they are resting. Purring

makes the whole of the cat's body vibrate with ultrasound (sound that occurs above the upper limit of human hearing).

Worldwide Distribution

Cats live in all types of climates and habitats, from humid tropical forests and swamps to deserts, and from lush grasslands to the snowy wastelands of Siberia. These mammals cope with heat by resting for long periods or by hunting at night or at dusk. In very cold places, cats such as the lynx, Siberian tiger, and snow leopard rely on incredibly thick fur to keep warm. The snow leopard has a long, fluffy tail, which it wraps over its face when sleeping to stop its breath from freezing.

Most cats live alone; only lions and some small cats live in groups. Lions are unusual in the way a pride works as a team to hunt and defend territory. Female cats usually give birth to their offspring in a den and spend months or years teaching them to hunt.

Rare Cats

Cats are naturally rare because they need lots of space in which to hunt. Large species have been persecuted for hundreds of years because they threaten livestock and even people. They have also been hunted for their beautiful fur. Many cats have suffered badly when natural habitats, such as forests, are destroyed. Scientists think the world's rarest cat is the Iberian lynx. There are probably fewer than 600 left in the wild.



▲ *A domestic cat focuses on a mouse, which has little chance of escape.*

NICE KITTY?

Cats and people have an extremely long history of living together. Cats are now among the most popular pets, but to begin with they were kept as mouse killers or even worshipped as living gods. Cats began to be domesticated around 7,000 years ago in the Middle East. Thanks to people, cats now live wild in many places where they did not occur naturally, such as Australia, New Zealand, and many islands. In these places, cats can cause a serious problem, killing native animals that have few natural defenses against cats.

CHEETAH

Cheetahs are the fastest animals on four legs. They can reach 60 miles per hour when they sprint to catch their prey. Cheetahs are the only big cats that hunt mainly in the daytime.





The cheetah is an unusual member of the cat family. Its narrow, streamlined body is built for speed rather than strength. Unlike other cats, cheetahs have blunt claws that they cannot retract (pull back) into their paws. The cheetah's claws help it grip the ground firmly when it runs fast.

Cheetahs have a small, rounded head, which is quite different from that of other big cats. Their ears are also small, which helps make the cheetah more streamlined. On its face, a cheetah has two lines of black fur running down from its eyes to the corners of its mouth. These lines are sometimes called tear lines. They make cheetahs look as if they have been crying black tears.

Hunting Antelope

Cheetahs usually hunt medium-sized prey, such as small antelope, which are hoofed mammals. Cheetahs also attack the calves of larger antelope, and they also prey on hares and other small animals.

When hunting, a cheetah creeps carefully toward its prey until it is about 33 yards away. It then dashes at full speed toward the prey. About half of these attacks are successful. Cheetahs kill their prey by gripping it around the throat so that it cannot breathe.

Cheetahs can only run around 550 yards at full speed. After that, they are in danger of overheating. They also need to catch their breath. Cheetahs have large nasal passages, or air tubes, behind the nose. That

A female cheetah crouches in the grass with her cub. Distinctive markings help camouflage the cats, allowing them to get close to prey when hunting.

Fact File

CHEETAH

Acinonyx jubatus

Family: Felidae

Order: Carnivora

Where do they live? Africa and the Middle East



Habitat: Savannas and dry forests

Size: Head-body length
44–53 inches
(112–135 cm);
weight 86–143 pounds
(39–65 kg)



Coat: Yellow-brown, with small, round, black spots; each cheetah has a slightly different pattern of spots

Diet: Mainly medium-sized antelope in Africa

Breeding: Females can breed at 2 years old and males at 3 years; 1–6 cubs per litter

Life span: Up to 12 years in the wild, and 17 in captivity

Status: Endangered; estimated 5,000–15,000 left in the wild in Africa and 200 in Asia



CHEETAH

helps them breathe deeply while their mouth is busy choking their prey.




Sometimes a cheetah finds prey by chance when walking through long grass. Newborn antelope calves often lie hidden in grass while their mothers are away. Usually the calves are safe enough—but not if a hungry cheetah comes along.

A cheetah often drags its prey to a hiding place before eating it. If it does not, a more powerful animal, such as a hyena, may come along and steal the cheetah's food.

Hiding the Cubs

Female cheetahs give birth to between one and six cubs at a time. A cheetah cub weighs around 8 to

DID YOU KNOW?

-  Young cheetahs sometimes try hunting animals that are much too big, such as buffalo!
-  Cheetahs hunt by day more than other big cats!
-  Mother cheetahs bring back live prey for their cubs to practice pouncing on!

11 ounces when it is born. The cubs stay hidden in a lair until they are around eight weeks old. The mother brings up her cubs by herself, without any help from the father or other cheetahs.

Cheetah cubs are born with long thick gray hair down their back. They lose this hair later. The cubs are very playful. Sometimes they play so

A CHEETAH CHASES ITS PREY





much that they scare away prey before their mother can get close enough to chase it. Many cheetah cubs do not survive. In parts of eastern Africa, nineteen out of twenty cheetah cubs are killed by lions.

Hunting Techniques

Cubs live on their mother's milk until they are around three or four months old. After that, they eat meat killed by their mother. At the same time, the mother helps the cubs learn to hunt. Sometimes she brings a small prey animal back alive to her cubs. The cubs then practice pouncing on the prey. Cubs stay with their mother until they are up to eighteen months old.



CHEETAH GENES

Genes are the biological instructions present in the cells of the body. They are made of deoxyribonucleic acid (DNA). An animal's genes are a mixture of the parents' genes. Whether a person has blue or brown eyes depends on his or her genes. Scientists have discovered that the genes of cheetahs show much less variety than those of people or other animals. One explanation may be that thousands of years ago cheetahs nearly became extinct. If this theory is right, then all present-day cheetahs might be descended from a few related individuals, which all had similar genes.



🔍 *This cheetah is chasing after a gazelle. Unlike other large cats, a cheetah has blunt, straight claws that cannot be fully withdrawn into its paws. This arrangement helps the cheetah grip the ground as it twists and turns during a chase. Once the gazelle is caught, the cheetah grips its throat for the kill.*

CHEETAH



CHEETAHS AND GUARD DOGS

Between 1980 and 1990, farmers in Namibia, southwestern Africa, killed more than 6,000 cheetahs. The farmers were afraid that the cheetahs would attack their farm animals. Now people are trying a less destructive way to protect farm animals, using guard dogs. Farmers in some places have started using a breed of large, fierce dogs called Kangal shepherd dogs. The Kangal dogs grow up with the farm animals and have an instinct to protect them. These dogs are good at not only scaring away cheetahs but also leopards, baboons, and even human poachers.

Adult Lives

Male and female cheetahs live quite different lives. Female cheetahs who are sisters usually stay together for around six months after they leave their mother. After that, they go their separate ways. Adult females live alone except when they have their own cubs. They wander widely and do not have a permanent territory.

By contrast, young male cheetahs often team up into pairs or groups of three. The members of the group are usually brothers, but not always. The group members stay together for life. Unlike females, male cheetahs claim an area of land as their own territory and defend it against other males. Pairs or groups of cheetahs are more successful at holding onto a territory than single male cheetahs. Males without a territory are less healthy and less likely to breed with females.

Scientists are not sure why female cheetahs never live together in groups. It might seem safer for the cubs to have more than one adult around, but females remain solitary.

Habitat and Survival

Cheetahs live in Africa and Asia, mostly in open country, such as grassy plains. It is easy to chase after



prey on these plains. At one time, cheetahs were extremely widespread throughout India and other parts of Asia. However, there are hardly any Asian cheetahs left in the wild, perhaps only 200 or so individuals living in remote parts of Iran.

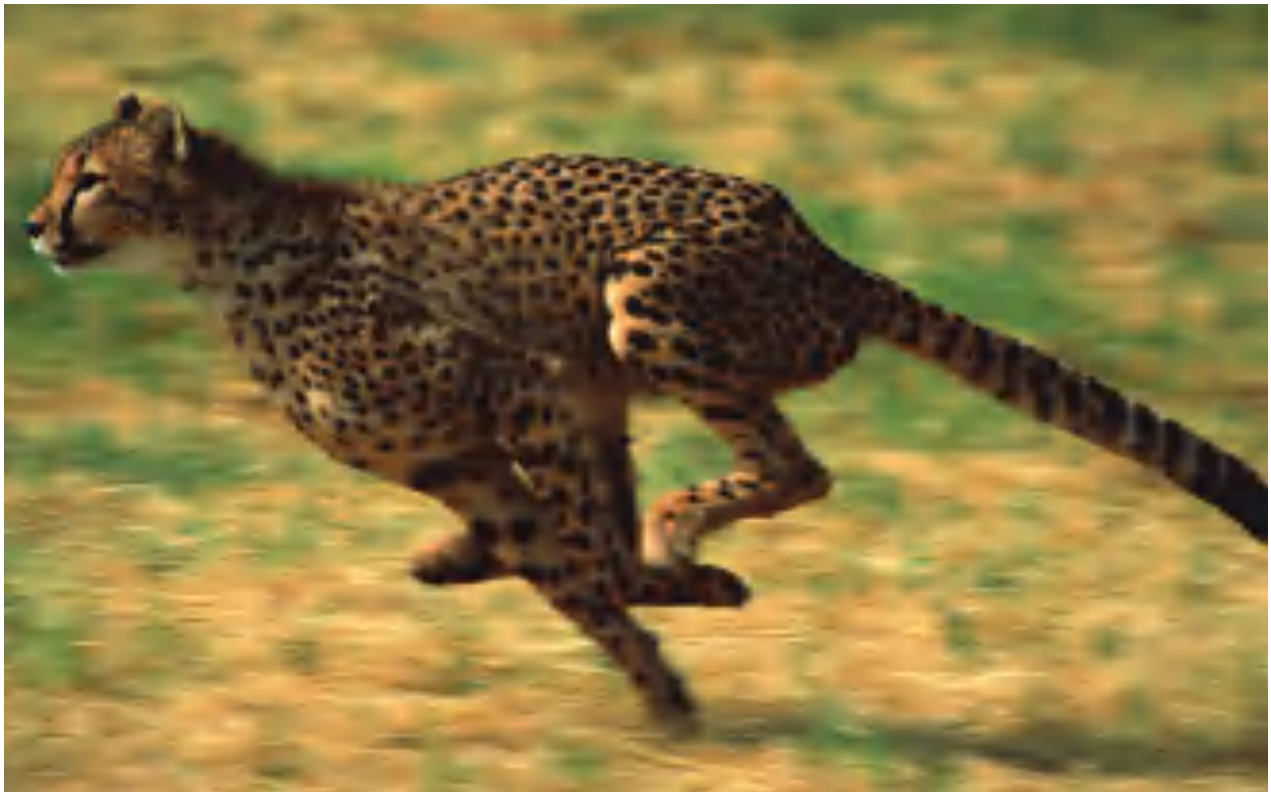
Although cheetahs are more common in Africa, they are also under threat there (see the box on facing page). Even when they are protected in national parks, cheetahs are still at risk from lions attacking their cubs. One good thing is that

DID YOU KNOW?

- Emperors of India used to keep tame cheetahs for hunting wild animals!
- Cheetahs are not closely related to other big cats.
- Cheetah cubs make a squeaky mewling sound when they call to their mother.

zoo owners are now more successful at breeding and raising cheetahs. In the past, cheetahs were extremely difficult to breed in captivity.

At full stretch, a cheetah can reach speeds of up to 60 miles per hour. It can only maintain that speed for a relatively short distance, however.



CHIMPANZEES

Experts now believe that chimpanzees are human's nearest relatives in the animal world.

There are two species of these intelligent apes, both living in tropical parts of Africa.





Until the 1960s, people knew much more about chimpanzees in captivity than in the wild. Scientists would give captive chimps problems and puzzles to solve to see how intelligent they were compared with humans. People also tried to teach languages to chimpanzees. Since then, scientists have discovered a great deal more about how chimpanzees behave in their natural environment.

There are two species of chimpanzees in Africa: the common chimpanzee (usually just called “the chimpanzee”) and the bonobo. A bonobo has a more slender body than a chimpanzee. It is also less common and shows various differences in behavior and lifestyle.

Close African Relations

Most experts now think that chimpanzees and humans are more closely related to each other than either is to other apes, such as gorillas. Much of the evidence for this view comes from comparing the deoxyribonucleic acid (DNA) of chimpanzees and people, which is very similar. DNA is the genetic (inherited) material. It carries all the instructions that an organism needs to survive.

By studying DNA evidence, scientists think that the ancestor of both chimps and humans probably lived in Africa around six million years ago. That is very recent compared with the whole history of life on Earth. Fossil bones might give more detailed evidence,

A chimpanzee pouts its lips when it is unhappy about something. Chimps have a huge range of facial expressions that tell others exactly how they feel.

Fact File

CHIMPANZEES

Family: Hominidae (2 species)

Order: Primates

Where do they live? West and Central Africa



Pan troglodytes

(common chimpanzee)

Habitat: Forests and savannas

Size: Male's head-body length: 30–36 inches (77–92 cm); female 28–33 inches (70–85 cm); male weighs up to 200 pounds (90 kg); female up to 176 pounds (80 kg)



Coat: Mainly black; gray on back after 20 years

Diet: Mostly fruit; other plant parts

Breeding: gestation 230–240 days

Life span: 40–45 years in wild

Status: Endangered

Pan paniscus (bonobo)

Habitat: Humid forests

Size: Male's head-body length: 29–33 inches (73–83 cm); female 28–30 inches (70–76 cm); male's weight: 86 pounds (39 kg); female 68 pounds (31 kg)

Coat: Black, including face

Diet: Mostly fruit; other plant parts

Breeding: gestation 230–240 days

Life span: Unknown

Status: Endangered



CHIMPANZEES

but hardly any ape fossils of the right age have yet been discovered.

The common chimpanzee now lives across tropical regions of Africa, from west to east. It lives mainly in forests but also in drier savanna regions, as long as there are enough trees around to provide shelter and food, particularly fruit.

▼ *A chimpanzee uses a rock to crack open a nut placed on a hard surface. Chimps are capable of using a variety of tools to perform different jobs.*

Bonobos live only in tropical rain forests. Their range does not overlap with that of chimpanzees. Bonobos dwell only in forests south of the Congo, an extremely wide river that flows through Central Africa.

Chimpanzees live only north of the river. Chimps do not swim, but scientists think that some ancestors of chimpanzees must have somehow



DID YOU KNOW?

- Older chimps often go bald on the head—females more than males!
- Chimps sleep in trees at night, in nests made from broken and bent-over branches!
- Chimps sometimes use sticks and stones as weapons to throw at other chimps!

gotten across the river more than a million years ago. They then became isolated and evolved into the present-day bonobo.

Body and Brain

Chimps and bonobos have a body adapted for living both in trees and on the ground. In both species, the arms are longer than the legs and are much stronger than human arms. A chimp's fingers are longer, too. These features help chimps climb and swing among trees, where they spend most of their time. On the ground, chimps move on all fours, using the knuckles of their hands to walk on. They can also stand and walk awkwardly on their hind feet.

Chimpanzees have a large brain, although not as big as a human's. Intelligence is not easy to define, but chimps are good at solving problems, learning from experience,



and predicting how other chimps (and scientists) are going to behave.

People have tried several times to teach language to chimps. They do not try to make chimps speak, however; chimpanzees do not have the right shape of voice box for speech. One research program involves teaching bonobos to communicate by arranging small plastic shapes. Each shape means a different word. Bonobos seem to be able to put the shapes together to create their own messages. These messages are like short sentences, which the scientists studying the bonobos can understand.

A Fruity Diet

Chimpanzees and bonobos are active during the day and spend about half of their time eating. The two species have similar diets, although there are some differences. They both eat plants and animals, but plant food is more important. Chimps eat anything from termites to monkeys.

Chimpanzees also eat from as many as twenty different plants a day and around 300 species a year. For both chimps and bonobos, fruit is the most important single type of food eaten. On some days, chimps



GOING HUNTING

Chimpanzees, especially groups of males, go hunting regularly. Their favorite prey is monkeys, especially red colobus monkeys. Individual chimps coordinate their behavior so that a monkey is trapped in a particular tree with no escape, and the chimps can grab it. What they do after that varies. Sometimes they share the dead monkey peacefully, but at other times they fight over who gets the meat.

CHIMPANZEES

▼ A chimp “fishes” for termites with a twig.

▶ A male chimp throws a stick as part of a charging display.



USING TOOLS

At one time, it was thought that only people used tools, especially tools that they made themselves. That view changed when scientists started studying chimpanzees in the wild. For example, chimps can catch termites, which are antlike insects that live in colonies in hard mounds. To do so, chimpanzees take twigs and cut and shape them to length. They stick the twigs into the termites' mounds and pull them out covered with termites, which they then eat. Chimps also open hard nuts and fruit by hitting them with one stone against another hard surface. These actions are learned behaviors at which individual chimps can take years to become skilled. Different chimp groups have different things they are good at, and pass on their skills to their youngsters.

may eat just from a single kind of tree fruit that happens to be available. Chimps also eat leaves all year long. Bonobos sometimes catch small antelope but usually do so alone. By contrast, chimps often go hunting in groups (see the box on previous page).

Social Life and Breeding

Chimps live in social groups of 15 to 150 members. Each group has a territory that it defends against outsiders. Members of the group cooperate but are hostile to neighboring groups. The group often splits up temporarily into smaller parties to look for food. Males stay in the same group all their lives, but young females often leave to join other groups.

Chimps stay friendly with one another by engaging in activities such as grooming each other's fur. Chimps also make sounds to express how they are feeling. In addition, they have a wide range of facial expressions that show friendship, fear, playfulness, and aggression. Male common chimps are larger and more dominant than females, and one male is usually the most dominant. Males form strong bonds with each other. They



DID YOU KNOW?



A chimp's mood can be judged from its facial expressions!



Chimps sometimes hunt monkeys for food!



Bonobos are much less aggressive than common chimps.

cooperate in hunting and also in attacking neighboring chimp groups. Chimps can be very aggressive and may attack, kill, and even eat members of other chimp groups.

Bonobos are much less aggressive than chimps and do not seem to attack their neighbors. Male and female bonobos are also more equal.

The mating behavior of chimps and bonobos is complicated, but females usually mate with most or all of the males in their group. Young chimps are very playful. They are heavily dependent on their mother for several years. A female is ready to breed at around thirteen years old.


A Threatened Future

As with many African mammals, destruction of the chimps' habitat by humans is threatening their future. Chimps are also hunted for food, even in national parks, as part

of Africa's bush meat trade.

Chimpanzees also die or are injured by traps set for other animals.

Bonobos are particularly at risk because they live in a smaller area than chimpanzees. Also, although there are individual bonobos in captivity, there are no breeding populations of bonobos that could be used to restock habitats in the wild. By contrast, chimpanzees are often bred in captivity.

 A young chimp rests among the trees. Chimps have a long infancy, and are not weaned until they are around four years old.



CIVETS AND GENETS

Civets and genets are graceful, agile animals that live mostly in Africa and southern Asia. They belong to the order Carnivora, which includes cats, dogs, and bears. Although *carnivore* means “meat eater,” some species of civets live mainly on fruit.





Imagine a long, stretched-out cat with a pointed nose. That is a good description of what many civets and genets look like. Other species have faces more like a dog or a raccoon. A few species have webbed feet and swim in rivers to catch fish, just as otters do.

Scientists have always found civets and genets hard to classify. With their long body and short legs, they seem not much changed from the first carnivores, or meat eaters, to walk on Earth, long before cats and dogs evolved. Scientists know what sort of body shapes early carnivores had from fossils found in rocks.

Among the more catlike members of the group are genets (eleven species) and linsangs (four species). They are all nocturnal (night active) and hunt for prey in trees. Many of these animals have beautiful coats marked with spots or stripes.

By contrast, the true civets of Africa and Asia hunt on the ground. They eat both animal and plant food. There are also several species called palm civets. Palm civets eat mainly fruit, either by climbing trees or by picking it up off the ground.

Recently, scientists discovered that the African palm civet is so different from all other civets that it deserves to be in a family of its own. There are also three civetlike species that live on the large island of Madagascar (eastern Africa), which is famous for its unusual animals. Scientists now think that the Madagascar civets also belong in a separate family.

Always on the alert, this African palm civet has climbed a tree to search for fruit and small mammals. This species spends most of its time in the treetops.

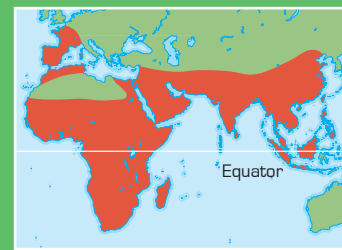
Fact File

CIVETS AND GENETS

Families: Viverridae (35 species) and Nandinidae (1 species, the African palm civet)

Order: Carnivora

Where do they live? Africa and southern Asia; 1 species lives in Europe and the Middle East



Habitat: Depends on species; many live in forests

Size: Varies with species; head-body length 13–35 inches (33–88 cm); weight from 1.3 pounds (0.6 kg) in the spotted linsang to 29 pounds (13 kg) in the African civet



Coat: Many species have catlike spots or stripes; others are more plain

Diet: Small mammals, birds, reptiles, insects, eggs, and fruit

Breeding: gestation 70–90 days

Life span: Up to 20 years in wild; one genet lived 34 years in captivity

Status: Some species endangered; others still common



CIVETS AND GENETS

Varied Lifestyles

Many civets and genets live secretive, nighttime lives in forests. Scientists do not yet know much about some of them. Most information comes from a few better-known species.

Most civets and genets have sharp, catlike claws that help them find food in trees. True civets have an extremely varied diet. For example, the African civet eats small mammals, ground-living birds, carrion (dead animals), reptiles

such as lizards, and insects. They also eat fruit.

Most of the time, civets and genets live alone. The species that have been studied are territorial—and males in particular are known to defend territories against other males of the same species. All civets and genets probably use scent to mark their area. Dominant male palm civets have large territories, which gives them a much better chance to meet and mate with females. If another

1 An African linsang raids a bird's nest and takes a baby bird. Linsangs are close relatives of civets and genets.

2 This banded palm civet is eating a lizard. All palm civets eat a wide variety of food, including fruit, birds, and mice.

3 A Malayan civet sniffs the ground. It has raised the crest of hair along its back, perhaps because it senses danger.

4 By scenting the air, this Asian palm civet can figure out whether there are any intruders in its territory.

5 A binturong looks for food while it grasps a branch with its prehensile tail. Binturongs are stockier than civets.





THE ODD ONE

The binturong is a strange-looking relative of palm civets. It lives in parts of Asia, where it climbs trees to eat the fruit. The binturong is heavily built, with long, coarse, black hair. Its other name is bearcat. Unlike all other civets and genets, the binturong has a prehensile, or grasping, tail. The binturong winds its tail around branches to prevent it from falling out of trees. Despite their fierce appearance, binturongs can become tame and playful in captivity.



male challenges the dominant male, there can be a fight to the death.

Civets and genets may produce babies once or twice a year, depending on the species and where they live. The mother raises her offspring alone. She looks after them for several months. They are probably ready to breed by around two years old.

Civets, Genets, and People

Unfortunately for civets, people discovered centuries ago that these animals produce a valuable substance from scent glands near their tail. This “civet oil” used to be an important ingredient in perfumes, although it is now used much less.

However, civets were often hunted and killed for their oil, which people also thought had medicinal properties. Civets are now kept in captivity in parts of Asia, both for their oil and because people eat their meat.

Civets and genets are intelligent and playful and are sometimes kept as pets. Before domestic cats became common, people in parts of Europe kept genets to catch mice and rats.

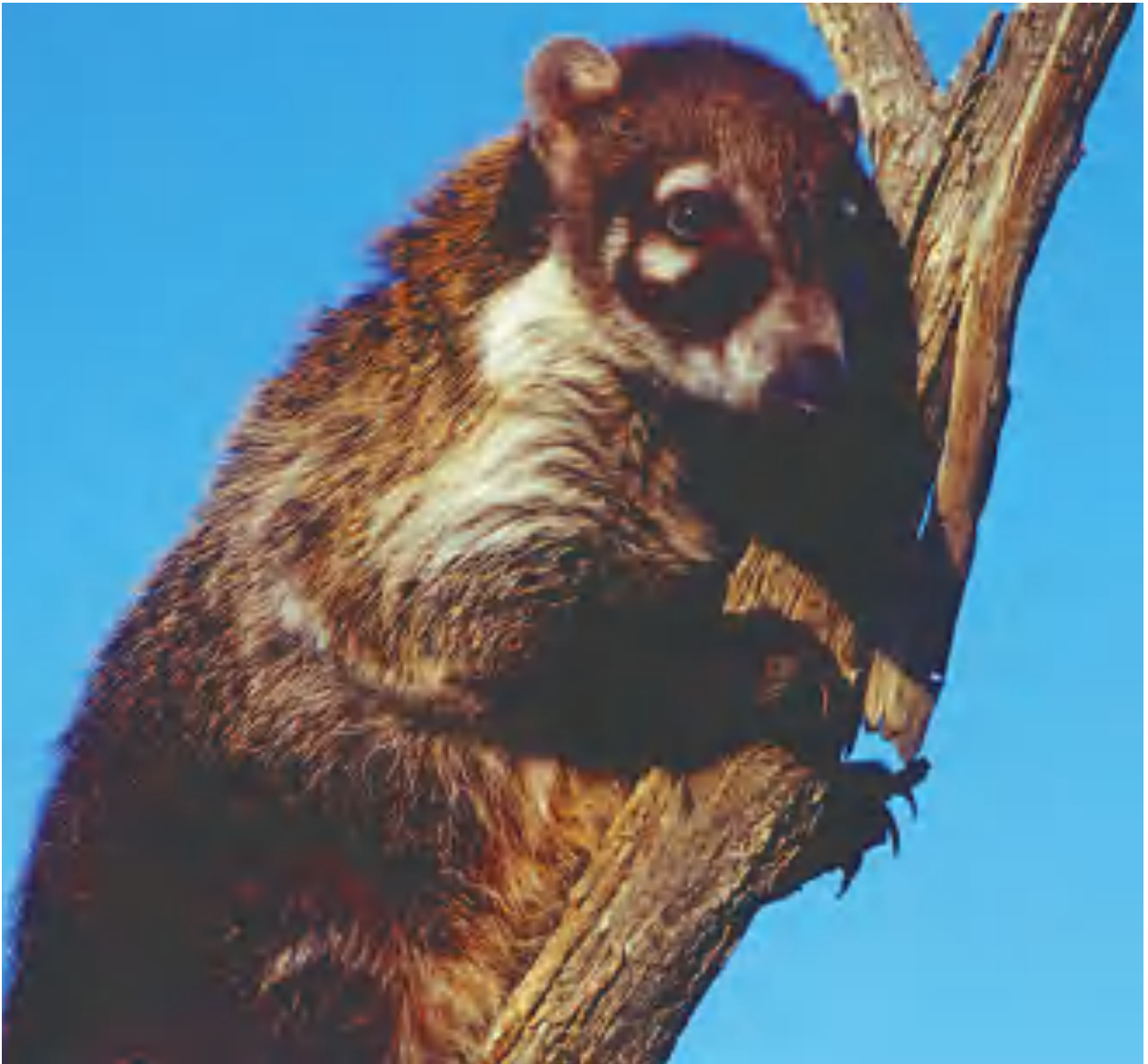
Some species of civets and genets are now endangered, mainly because their rain forest habitat is being destroyed by people. On the other hand, other species such as the Asian palm civet have got used to humans and often live around villages and plantations.

DID YOU KNOW?

-  Civets and genets wash their faces with their paws just as cats do!
-  Genets are playful and are sometimes kept as pets!
-  A few species live on riverbanks and catch fish just as otters do!
-  Male and female African palm civets make owl-like calls at night to stay in touch!

COATIS

Coatis are long-nosed, agile relatives of raccoons. They live wild only in the Americas, mainly in tropical forests. Playful and inquisitive, coatis are also popular as zoo animals.





Coatis survive well in many habitats and are active by day. The four species prefer forests but they also live in grasslands and even semideserts. Coatis are omnivores—they eat both animals and plants. They use their long, flexible nose and sharp claws to root out food. Favorite food includes fruit and insects. Coatis hunt for food both on the ground and in trees. They can climb trees quickly to escape danger.

The ringtailed coati and the white-nosed coati are both common and widespread. By contrast, the dwarf coati lives only on one island in Mexico and is now endangered. The mountain coati lives in mountain forests in South America. Changes to its habitat are threatening this species, too.

Family and Social Life

Female coatis live in groups called bands, of up to twenty-five members. Living in a band means there are more eyes to watch for predators, such as jaguars. Young coatis are much safer being in a band. Coatis in a band often groom each others' fur, just as monkeys do. All the female coatis living in an area are ready to breed at the same time of year. A female leaves the band to give birth alone, usually in a tree. Mother and babies rejoin the band after a few weeks. By then, the young coatis can run fast enough to keep up with the adults.

Male coatis live alone but they usually stay near the band where they were brought up as youngsters.

This white-nosed coati has climbed up a branch. From this position it can keep a lookout for predators while other members of its band care for the youngsters.

Fact File

COATIS

Family: Procyonidae (4 species)

Order: Carnivora

Where do they live? Arizona to northern Argentina



Habitat: Mainly tropical forests; white-nosed coati also lives in dry areas

Size: Varies with species; head–tail length 20–50 inches (51–130 cm); weight up to 12 pounds (5.6 kg)



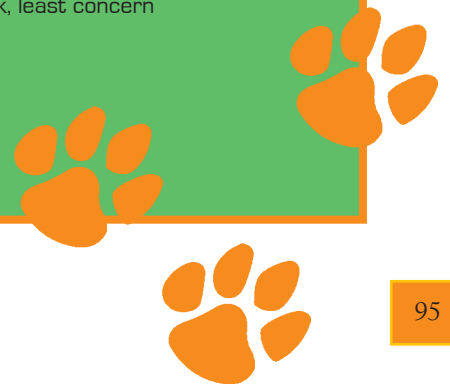
Coat: Coloring varies with species

Diet: Mainly fruit and insects

Breeding: Usually 3–4 offspring

Life span: 7 years in the wild; up to 14 years in zoos

Status: Dwarf coati endangered; mountain coati probably endangered; ringtailed coati and white-nosed coati lower risk, least concern



COLOBUS MONKEYS

Colobus monkeys and their relatives live in Africa and Asia. They specialize in eating leaves. These monkeys can feed on plants that would poison most other animals.





Colobus monkeys are Old World monkeys; they and their relatives live only in Africa and Asia. Eleven species of colobus monkeys live in Africa; around thirty species of related monkeys live in Asia. The Asian species have various names, including leaf monkeys, langurs, doucs, and surelis. Both colobus monkeys and all of these Asian monkey species belong to the subfamily Colobinae, or colobines. Other Old World monkeys, such as baboons, are grouped in a different subfamily to colobines. These other monkeys have much less specialized diets than colobines.

Most colobus monkeys have a similar body shape. They are slender, with powerful hind legs for jumping through trees and a long tail for balance. The color of their coat varies a great deal between species.

Colobines often have distinctive markings, such as tufts of long hair on their head. Baby colobus monkeys often have a different coat color from adults.

African colobus monkeys have almost no thumb, just a tiny bump. Perhaps, during evolution, having a thumb was more of a nuisance than a help when they jumped through the trees.

Safe in the Trees

Most colobine monkeys live in forests. They are active during the day and usually sleep in the safety of a tree at night. They are adaptable, however, and can also survive in other habitats, both natural and artificial.

A serious-faced colobus monkey rests its chin on a branch. Colobus monkeys are not generally aggressive and do not make many facial expressions.

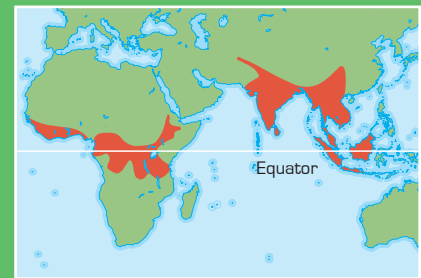
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COLOBUS MONKEYS

Family: Cercopithecidae; subfamily Colobinae (42 species, including proboscis monkeys, langurs, and leaf-nosed monkeys)

Order: Primates

Where do they live? South and Southeast Asia, and tropical Africa



Habitat: Mainly forests; also scrublands, cliffs, and urban areas

Size: Varies; head-body length from 16–31 inches [41–78 cm] in Hanuman langur to 17–20 inches [43–49 cm] in olive colobus; tail length 23–43 inches [57–108 cm]



Coat: Varies with species

Diet: Leaves, fruit, flowers, buds, seeds, and shoots

Breeding: Usually 1 offspring

Life span: Around 20 years, and 29 years in zoos

Status: Red colobus and proboscis monkey endangered; black colobus and Geoffroy's black and white colobus vulnerable

COLOBUS MONKEYS

Some Asian species even live in rocky, treeless slopes and cliffs. Others are at home in cultivated land, such as farms, where they may eat the crops.

The most active species is called the Hanuman langur. It is named for the monkey god Hanuman in the Hindu religion. In India, many Hindus treat the Hanuman langur as sacred and do not attack it. The monkey often lives in town centers, sometimes raiding shops for food.

Two-part Stomach

A major difference between colobines and other Old World monkeys is the way in which their stomach is formed. Colobines have a stomach divided into two sections. The lower part contains acid and digestive enzymes. The upper section is expanded and is not acidic. Bacteria (microscopic single-celled organisms) live in the upper stomach. These bacteria help break down the tough leaves that colobines eat so they can be digested. The bacteria probably also help destroy poisons in the leaves. Many plants have poisons in their leaves, which prevents some animals from eating them.

All colobus monkeys eat leaves but they also eat other parts of plants,



BIG-NOSED MONKEYS

Perhaps the weirdest looking colobine is the proboscis monkey. It lives only on the island of Borneo, in Southeast Asia. *Proboscis* means “nose,” and the male proboscis monkey has a long, dangly nose that may be 3 inches long. It even gets in the way of eating. However, having such a long nose is worth it because the females seem to like males with the longest nose. Proboscis monkeys are unusual in other ways, too. Less slender than other colobines, they often live by the sea in the trees of mangrove swamps and are good swimmers. Proboscis monkeys are now endangered.

such as fruit, seeds, and roots. Some colobines lick the sap from trees and even eat dead wood. Colobines also sometimes eat small amounts of insects or other animal food.



DID YOU KNOW?

- Colobines have a two-part stomach that helps digest the leaves they eat.
- Some of their scientific names reflect what the person who gave the name thought the colobus monkeys looked like: one genus name means “solemn ape,” while another means “old woman”!
- The female olive colobus carries its baby around in its mouth!

Monkey Business

Compared with other monkeys, colobus monkeys have quiet, relatively peaceful social lives. They show less aggression toward one another and use fewer calls, gestures, and facial expressions than other monkeys. People often think colobine monkeys look solemn and serious compared with other monkeys.

Scientists think that this lack of aggression is connected with the way in which they feed. Tree leaves have low food value, and colobines need to spend a lot of the day quietly eating.

A group of colobines in a tree take up positions in different branches. They usually sit facing outward, looking toward the end of the branch where most of the leaves are. So, they do not look at each other for much of the time.

Colobus monkeys usually live in groups. The size of the group varies widely from three or four individuals to sometimes more than a hundred. One or two species live as pairs, with one male living with one female. Some groups defend the area in which they live as a territory and chase away other monkeys of the same species. Surelis, langurs, and some colobus monkeys make loud calls, especially at dawn. Scientists think that these calls may be to make

▼ *A colobus monkey plucks the leaves from a tree. It is sitting in a typical feeding position, with its back toward the tree trunk.*



COLOBUS MONKEYS

it quite clear to other monkeys that a patch of forest is already occupied.

Not all is peaceful in colobine society, however. Some groups are controlled by a single male. If another male attacks and defeats him, the second male may kill the group's babies. In this way, the new male causes the group's females to be ready to breed again. He can then father his own babies.

Breeding Behavior

Female colobus monkeys are ready to breed when they are around four years old. There is no set breeding

season, but births are more common at some times of the year than others. The female colobine usually approaches the male when she is ready to mate. In Hanuman langurs, the female may hit the male, pull his fur, or even bite him if he does not respond to her.

At birth, baby colobus monkeys weigh around 14 ounces. A single infant is usually born, and twins are rare. The mother carries her baby around, with it clinging on tightly to her. One exception is the olive colobus of Africa, where mothers carry their baby in their



MONKEY GET-TOGETHERS

Colobine monkeys team up not only with each other but also with other species of monkeys. In West African forests, red colobus (left) and olive colobus monkeys both like teaming up in the same area as Diana monkeys, which are not colobines. This arrangement means there are more eyes and ears to look out for predators. Predators include eagles, leopards, people, and chimpanzees, which often hunt colobus monkeys. Diana monkeys are extremely alert and they also eat different food from colobines, so they do not compete for the same meals.






mouth. Other female colobines in the group often borrow a baby and seem to enjoy babysitting.


Colobines and People

As with many forest-living animals, colobines are in danger from people burning and chopping down their forest homes. People also kill colobines for food. In Asia, monkeys are also traditionally killed because people believe that their body parts have medicinal properties.

People have also hunted colobus monkeys for their beautiful fur. Conservationists are now trying to protect the rarest species.

DID YOU KNOW?

-  Some colobines can leap 16 feet through the trees without moving downward!
-  The Hanuman langur of India is sacred in the Hindu religion.
-  A female Hanuman langur may attack a male that is showing no interest to mate with her!

 A baby colobus monkey perches among the branches of a tree, waiting for its mother to rejoin it. The baby will hold on tight while she carries it around.

COYOTE

Coyotes are an animal success story. Once, coyotes lived only in southwestern United States and Mexico. Now they have spread over nearly all of North America.





Coyotes are members of the dog family. They are larger than foxes but smaller than wolves. Coyotes have long slender legs, large pointed ears, and a bushy tail. Coyotes eat many different kinds of food. They usually hunt for small mammals such as rabbits and gophers. Sometimes they team up to chase deer and other large prey. They also eat birds, turtles, carrion (dead animals), and even garbage.

Coyotes usually patrol a particular area, called a home range, for food. Where food is scarce, as in Alaska, a home range can be as large as 40 square miles. Since the 1800s, coyotes have greatly expanded their range in North America. One reason is probably that European settlers killed the wolves living in many areas. The coyotes were then able to take the wolves' place, eating their food and living in their habitats. Coyotes also live successfully in towns and cities. They like eating sheep, too, which makes coyotes unpopular with some farmers in country areas.

Social Life and Breeding

Sometimes coyotes live as a single male–female pair. In other places, they live in small packs. Being in a pack is an advantage because a pack can hunt large animals, such as deer. A pack can also defend its food better from other animals, including other coyotes.

Coyote pups are born in the spring. Only the dominant male and female in a pack usually breed.

A coyote pricks up its large ears to help it hear the faint rustling of prey. Coyotes also have excellent senses of smell and sight, just as other dogs do.

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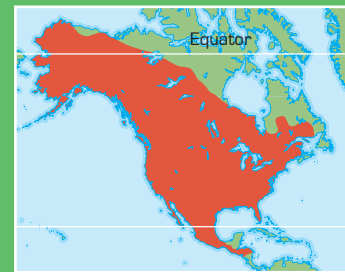
COYOTE

Canis latrans

Family: Canidae

Order: Carnivora

Where do they live? Most of North America, except the far north and east of Canada



Habitat: Varied; includes towns and cities

Size: Head–body length
28–38 inches (70–97 cm);
weight 17–42 pounds
(8–22 kg)



Coat: Grayish, with white throat and belly, and black patches on front legs and tail

Diet: Small mammals and birds; sometimes large mammals, such as deer, fruit, and domestic garbage

Breeding: Reach adulthood by 1 year old; average 6 pups per litter

Life span: Up to 14.5 years in the wild, and 18 years in zoos

Status: Not endangered



DEER

People have hunted deer for food or sport since prehistoric times. Despite that, these versatile animals are surviving well in the modern world. Some deer now even live wild in towns and cities.





Deer are hoofed mammals. They are distant cousins of cows and antelope. Cows and antelope have horns, but deer have antlers. Male deer, called stags, use their antlers to scare off or fight with other males. They also show off their antlers to females. Some deer have fangs or tusks as well. The ancestors of deer probably had tusks and later evolved antlers.

Deer Variety

There are forty-three species of deer. The largest deer is the moose. It grows up to 7 feet 6 inches high at the shoulder. This huge, forest-living animal lives in cooler regions of North America and Europe. The smallest deer species is the South American southern pudu, with a shoulder height of just 15 inches. One of the best-known deer is the caribou, which can survive extremely cold conditions. In Europe, most caribou (there, called reindeer) herds have been domesticated by people for hundreds of years. By contrast, the caribou of North America are still wild. The white-tailed deer, another common deer species, lives in North and South America. Shooting white-tailed deer is a popular sport in parts of the United States.

Habitats

Although deer are basically forest animals, they are adaptable. During the ice ages of the last two million years, many regions changed from forests to open

This white-tailed deer has a full set of antlers. During the mating season, or rut, the male uses its antlers to attract females and to fight off other males.

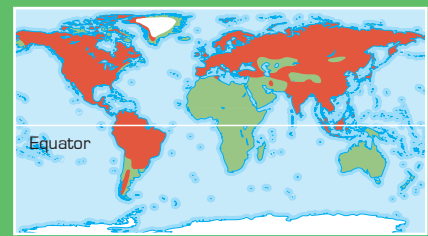
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DEER

Family: Cervidae (up to 43 species, including muntjacs, fallow deer, chitals, red deer, wapitis, roe deer, moose, and caribou/reindeer)

Order: Artiodactyla

Where do they live? Europe, Asia, North America, South America, and parts of north Africa



Habitat: Forests, grasslands, mountains, and arctic tundra

Size: Shoulder height from 15 inches (38 cm) in southern pudu to 7 feet 6 inches (230 cm) in moose; weight from 17.5 pounds (8 kg) to 1,750 pounds (800 kg) in same species

Coat: Mostly shades of gray, brown, red, and yellow; some adults and many young deer have lighter-colored spots



Diet: Plant food, including leaves of trees, bushes, and grass, lichens, fruit, and mushrooms

Breeding: Usually 1 or 2 offspring born in the spring

Life span: Up to 20 years in captivity

Status: 1 critically endangered species; 4 endangered; 5 vulnerable

DEER

landscapes and back again. Deer lived through these changes very well. By contrast, some deer do not survive well in other environments, such as tropical rain forests.

Deer do not live in Australia nor in most of Africa. In Africa, forest-living antelope have a similar lifestyle to that of deer living in other places.

In the forests and open country of northern North America, Europe, and Asia, deer are a very important part of the natural food chain. They eat everything from tree leaves to mushrooms. In turn, predators, such as wolves, lynx, and wolverines, catch and eat the deer.

Deer living in cooler lands usually shed their coats twice a year. The winter coat is warmer and usually

darker colored. Caribou also migrate, or travel, hundreds of miles between their winter and summer feeding grounds. Just like other deer, they are good swimmers. That means they can easily cross rivers and lakes during their migration.

Browsing Trees and Bushes

Although deer are plant eaters, they do not usually live off grass, as do cows and buffalo. Most deer's teeth and digestive systems are not able to process lots of rough food, such as dried grass. Instead, deer are mainly browsers—they eat from trees and bushes. They usually choose young, fresh tree shoots, which are full of nutrients. Deer also eat many other types of plants. They would also eat

DID YOU KNOW?

- Some deer have fangs as well as antlers!
- Moose can eat and digest tough pine needles.
- One extinct type of deer had antlers 13 feet across!

DIFFERENT SPECIES OF DEER

1. *Moose*
2. *Roe deer*
3. *Chital*
4. *Reeve's muntjac*
5. *Sika deer*
6. *Tufted deer*
7. *Père David's deer*
8. *Water deer*





ANTLERS

Antlers are made of bone. They grow again every year. That makes antlers different from the permanent horns of sheep and cattle. Antlers start as small bumps on the head. At first they are covered with a living, bone-making skin, called velvet. When the antlers are fully grown, the deer scrape off the velvet. In caribou (right), females grow antlers as well as males. In most other deer, only males grow antlers. Antlers drop off when the mating season, or rut, is over.



all the flowers in a backyard if they got the chance. For some deer, including caribou, lichens are an important food. Lichens are a mixture of a fungus (a mushroom relative) and microscopic algae cells. Lichens

usually grow in tufts on tree bark, on rocks, and even on the soil in the cold, treeless tundra of arctic regions.

Social Life and Breeding

The habitats and social life of deer are closely linked. For example, small deer living in dense tropical forests do not usually live in groups, or herds. Instead, a single male claims part of the forest as his territory. He marks the boundaries with his own scent. These males usually have both tusks and small, pointed antlers. They use these weapons to defend their territory against other male deer.

Larger deer species usually live in more open forests or even in treeless areas. Often, a dominant stag collects



DEER

together a harem, or group, of females. The stag always stays near the females and fights other males who try to mate with them.

In open, treeless country, deer may gather into large herds. Being in a herd means an individual deer is safer from enemies, such as wolves.

In cooler climates, breeding is closely related to the seasons. In many species, males compete for females during fall, when their antlers are fully grown. This period of male rivalry is called the rut. Males often lock antlers and push each other in a trial of strength, called sparring. The weaker male usually gives in before serious damage is done. Sometimes real fights develop, and males may get injured or even killed.

Females who mate in the fall give birth the following spring. The young


deer, called a calf or fawn, often stays hidden at first. The mother returns to her calf and feeds it milk until it is large enough to follow its mother and run from predators.

People and Deer


Prehistoric cave paintings often include pictures of deer. There are also paintings showing people wearing deer antlers on their head. In northern lands especially, deer used to provide people with food, leather, tools made from antlers, and transportation. There are also many legends and folktales involving deer.

In Europe until around 1500 C.E., kings and nobles loved hunting deer. Although many deer were killed, they were also protected by law to stop poorer people from killing and eating them. Rich people often created deer

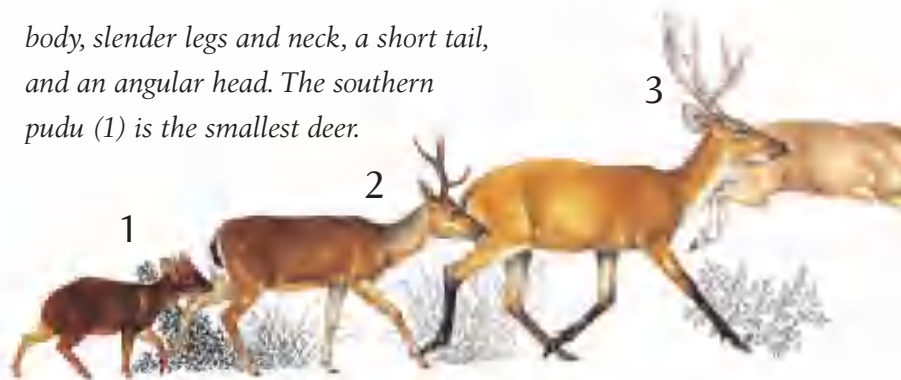
DID YOU KNOW?

-  If a deer gets into a backyard, it will eat all the flowers!
-  In India, some deer follow monkeys around and eat the food they drop!
-  Deer regrow their antlers every year!

RUMINANTS ALL

 Deer are similar in appearance to other ruminants, particularly antelope. Ruminants are mammals that “chew the cud”: After swallowing their food, ruminants bring it back up to the mouth and chew it again. Ruminants also have a many-chambered stomach. Most species of deer have a graceful, long

body, slender legs and neck, a short tail, and an angular head. The southern pudu (1) is the smallest deer.



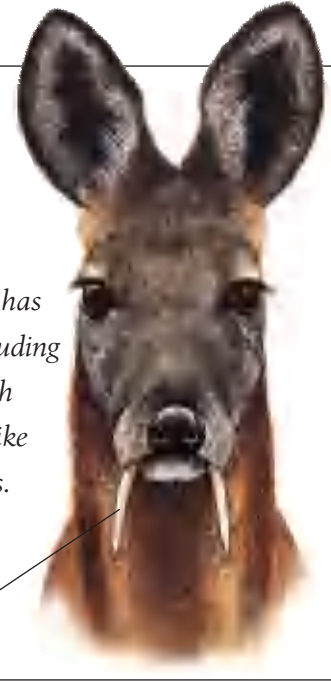


MUSK DEER

Musk deer are in a different family from other deer. They have tusks but no antlers. There are four species of musk deer: the Himalayan musk deer, the Siberian musk deer, the dwarf musk deer, and the black musk deer. All of these deer live in Asia. Musk deer are best known for the scent glands they have near their tail. These glands contain a substance called musk. Musk is valuable. For centuries, people have used it to make perfumes and as a medicine. Musk deer are now kept on farms, but thousands of wild musk deer are still killed every year for their musk.

▶ A male musk deer has long, protruding canine teeth that look like small tusks.

canine tooth



parks around their stately homes, partly to provide food and partly because the deer looked attractive. People have also taken deer to places where they have never lived naturally, such as Australia and New Zealand.

Some deer, such as white-tailed deer, have survived so well that they have become pests in towns and cities. On the other hand, some small tropical deer are under threat because their habitats are being destroyed.



1. Southern pudu
2. Pampas deer
3. Marsh deer
4. Peruvian huemul
5. Red brocket
6. White-tailed deer
7. Caribou

DHOLE

The dhole is a fierce Asian wild dog that hunts in packs. By working together, the pack can catch and kill animals much larger than a single dhole.





Dholes are sturdily built dogs, with a short, broad snout. They are not closely related to domestic dogs or wolves. Dholes are native to many parts of Asia but are now rare or extinct in many places.

Dholes live and hunt mainly in forests. They live in packs of up to twenty animals. Being in a pack helps protect dholes from attacks by leopards and tigers. A pack of dholes can also hunt with more success.

Dhole pups are born in the shelter of a den. The whole pack helps protect and guard the pups. Some pack members also help the mother feed the pups.

People have often killed dholes, partly because they sometimes attack domestic animals, such as goats. Dholes are now very rare except in nature reserves.

Food and Feeding

Dholes are mainly daytime hunters. A single dhole can catch and kill small prey by itself. Often, however, the whole pack goes hunting. Working together, the pack can catch and bring down large prey, such as the chital, a type of deer that lives in India. Dholes are smart hunters. Sometimes they chase prey out into the open, where other pack members are waiting to ambush it.

Once the prey has fallen to the ground, dholes start eating immediately. They start with the softer parts, such as the belly. The prey is often still alive, but it soon dies of blood loss. Dholes eat as fast as possible to try to get more food than any other pack member.

Dholes are sometimes called Asian wild dogs, red dogs, or Asiatic hunting dogs. A dhole looks like a large red fox but has a thicker neck.

Fact File

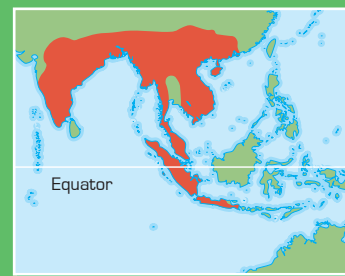
DHOLE

Cuon alpinus

Family: Canidae

Order: Carnivora

Where do they live? India and Asia, including Indonesia



Habitat: Mainly forests

Size: Head-body length:

35 inches (90 cm);

average weight

37 pounds (17 kg)



Coat: Light reddish brown above, underside paler, tail black

Diet: Mainly mammals but also lizards, insects, and wild berries

Breeding: Reach adulthood at 1 year; average 8 pups per litter

Life span: Up to 12 years in the wild, and 16 years in zoos

Status: Endangered in many parts of their range



DOGS

Members of the dog family are clever, adaptable hunters. Wolves, coyotes, jackals, and foxes are all placed in this family. Domestic dogs are almost certainly descended from wild wolves.

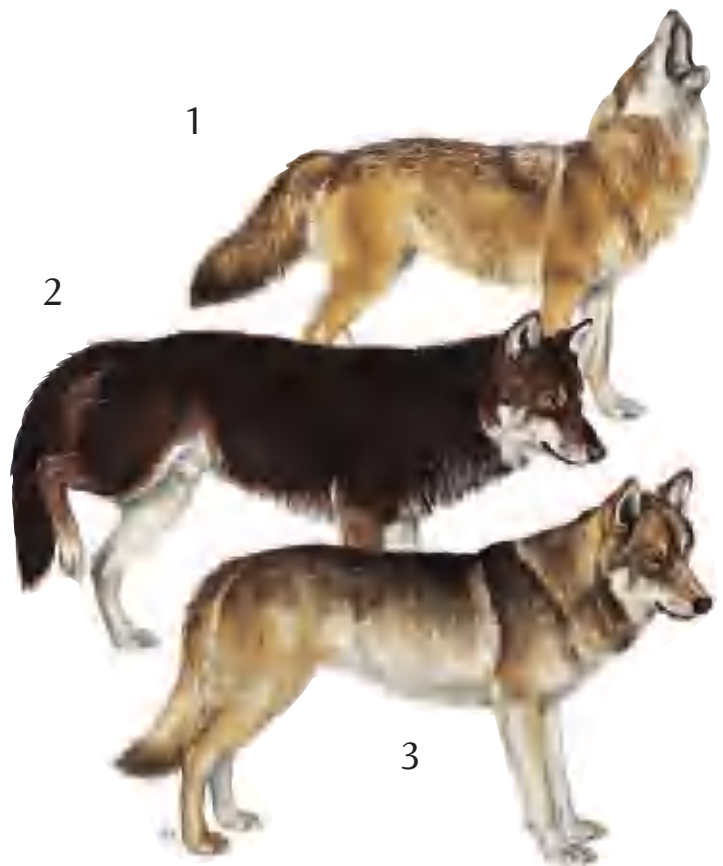
A typical canid, or member of the dog family Canidae, has a body suited to long-distance running. The first dogs that evolved probably caught their prey by chasing it across wide, open plains. Scientists have found fossil bones of canids in North America that are forty million years old. The dog family belongs to a large group, or order, of meat-eating mammals called Carnivora. Other families in Carnivora include bears, raccoons, and cats.

Dogs range in size from the gray wolf of the northern hemisphere to the tiny fennec fox that lives in deserts in Africa. Of the thirty-six dog species, twenty-three species are foxes. Foxes are smaller than other canids. They have a narrow muzzle (snout) and usually a long bushy tail.

Dog species survive in a range of different habitats, from the cold Arctic, to tropical rain forests and plains. In cold places, dogs have a thicker coat that keeps them warm.

Designed as Hunters




Canids hunt on the ground because, unlike cats, they are not good at climbing trees. Dogs' claws are blunter than cats' claws and



cannot be retracted (pulled back into the paws). This type of claw helps dogs get a good grip on the ground for running.

Dogs have good eyesight and excellent senses of smell and hearing. Dogs also have large canine teeth, often called fangs, to grip prey, and sharp back teeth that can slice flesh.

DID YOU KNOW?

-  The dog family probably first evolved in North America.
-  Many scientists now think that domestic dogs and wolves are members of the same species.
-  Dogs sometimes bring up food from their stomach to feed their pups!

Fact File

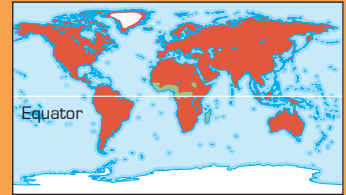
DOGS

Family: Canidae (36 species)

Order: Carnivora

Where do they live? Worldwide, except Antarctica and some smaller islands

Size: Head-body length varies from 9.5 inches (24 cm) in fennec fox to 58 inches (147 cm) in gray wolf; adult weight ranges from 2.2 pounds (1 kg) in fennec fox to 165 pounds (75 kg) maximum in gray wolf



Diet: Large species are mainly meat eaters; small species eat a mixed diet

See also: African wild dogs, Carnivores, Coyote, Dhole, Ethiopian wolf, Foxes, Jackals, Wolves

4



1. European gray wolf
2. Tibetan gray wolf
3. Wolf-husky cross
4. Arctic fox, in its partly white summer coat

Compared with the cat family, however, members of the dog family eat a much more varied diet. That is especially true of foxes, which often eat insects, worms, and fruit, as well as small mammals.

Some dog species, such as wolves and African wild dogs, hunt in packs. By working together, they can catch large animals, such as deer and even zebra. Unlike most cats, dogs do not hunt by ambushing or leaping out on their prey or by making a sudden dash as a cheetah does. Instead, dogs run steadily after prey, for hours if necessary. Eventually, the prey animal gets so exhausted that the dogs can catch, kill, and eat it. By contrast, foxes usually hunt for food alone.



The chihuahua is a small variety of domestic dog that comes from Mexico.





Social Behavior

Species of dogs that hunt in packs have extremely complex social lives. Packs of dogs usually have a dominant male and female pair, called the alpha pair. The alpha pair is in charge of each pack. In a wolf pack, for example, every wolf knows its place in the pecking order. A wolf can communicate aggression, fear, or friendliness to other wolves by the way in which it holds its tail and ears and even by the expression on its face. Canids also use sounds such as howls and barks to communicate.

Canids usually occupy a territory that they defend against other members of their species. Even dogs that do not live in packs have their

🔍 *A husky finds some prey beneath the snow. It rears up on its hind legs, ready to pounce.*

own territory. Each dog, or pack of dogs, marks the edges of the territory with scent.

A female canid usually gives birth to cubs in a safe lair, or den. In social species of canids, related animals, such as aunts and uncles, may help the mother look after the cubs.

Dogs often regurgitate meat (bring it back up from their stomach) for the pups to eat. In this way, the food is already broken up into small pieces and partly digested. Pups are extremely playful, often practicing their hunting and catching skills on each other.

People and Dogs

Prehistoric people probably caught and tamed wolf cubs occasionally. Scientists now think that these tamed wolves are the origin of the domestic dog. One example is the dingo, which lives in Australia. Dogs are not native to Australia, but the dingo has lived wild there for thousands of years. The first prehistoric people to reach Australia probably brought their own dogs. Some of these animals then escaped and evolved into the wild dingo.

People have always hunted wolves, foxes, and other canids, both to protect farm animals and as a sport. Some dog species, such as the Ethiopian wolf, are now extremely rare. Conservationists are working to preserve them. Other species, such as the red fox and the coyote, have adapted well to the human world and are now common in towns and cities.

▼ *The fennec fox is the smallest canid. Its huge ears allow it to lose heat in its hot desert home.*



▲ *A maned wolf looks over its shoulder. These dogs have extremely long, thin legs.*

THREE UNUSUAL DOGS

Wolves, jackals, and foxes are familiar species of dogs. Three of the more unusual dog species are:

Raccoon dog This Asian species looks more like a raccoon than a dog. People sometimes keep it on farms for its valuable fur.

Bush dog This dog has very short legs and small ears. It lives in tropical forests in South America. Not much is known about its life in the wild.

Maned wolf Despite its name, this red-coated canid does not look like a wolf but more like a fox on stilts. The maned wolf lives in woodlands and grasslands in South America. It feeds on small animals and fruit.

DOLPHINS

The graceful, playful activities of dolphins are familiar to everyone. Yet science still has a lot to learn about these intelligent and fascinating mammals.





Dolphins are small whales and live in all the world's oceans. Four species of river dolphins live in rivers. There are at least forty species of ocean and river dolphins. The bottlenose dolphin is probably the most famous and are often kept in dolphinariums. In the wild, bottlenose dolphins live in warm seas, usually near the coast.

The spinner dolphin is another common warm-water species. It prefers deep waters and, as with many dolphins, it enjoys leaping out of the water and then diving back in. When a spinner dolphin makes a leap, it spins around, which is how it got its name.

Many species of dolphins look quite similar, even when they are not closely related. That is partly because dolphins need to be streamlined to chase after their prey. Many dolphins also have similar patterns of spots or patches that are usually various shades of gray.

The largest member of the dolphin family is the killer whale, or orca (see the box overleaf). Unlike most dolphins, the orca has a blunt head, without a pointed beak. Next largest are two species of pilot whales. They also have a blunt head and grow nearly as long as killer whales but feed on much smaller prey.

Body Design and Blowholes

A dolphin has powerful muscles that move its flat tail up and down in the water. The tail movements push the dolphin along. Dolphins breathe air but, unlike

A bottlenose dolphin leaps high out of the water. All dolphins have a sleek, streamlined body, flippers, a dorsal (back) fin, and a powerful, muscular tail.

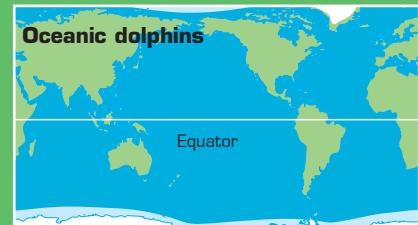
Fact File

DOLPHINS

Families: Delphinidae (ocean dolphins; at least 36 species) and 4 families of river dolphins (4 species)

Order: Cetacea

Where do they live? Worldwide



Habitat: Oceans and a few rivers

Size: Head-body length from 3 feet 6 inches (1.2 m) in Heaviside's dolphin to 23 feet (7 m) in the killer whale; weight from 88 pounds (40 kg) to 4.4 tons (4.5 metric tons) in the same species



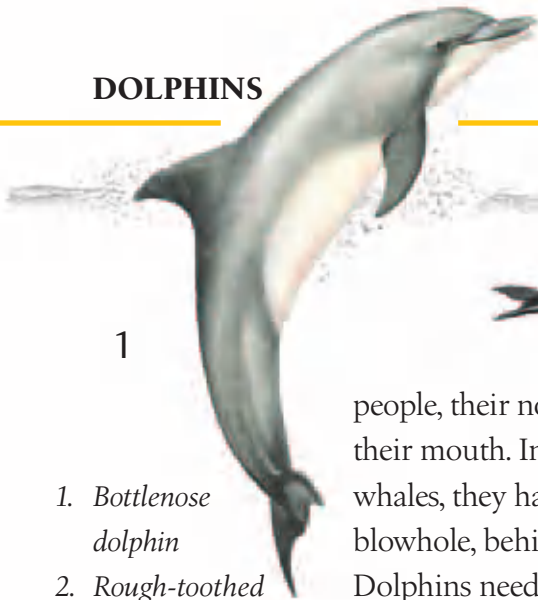
Diet: Fish or squid; killer whales also eat sea mammals and birds

Breeding: One calf (offspring) born every 2–3 years in most species

Life span: Up to 100 years in female killer whales

Status: 1 endangered marine species; river dolphins: 1 critically endangered; 1 endangered; 2 vulnerable

DOLPHINS



1. *Bottlenose dolphin*
2. *Rough-toothed dolphin*
3. *Atlantic white-sided dolphin*
4. *Atlantic spotted dolphin*
5. *Short-beaked common dolphin*
6. *Northern right whale dolphin*
7. *Atlantic hump-backed dolphin*
8. *Melon-headed whale*
9. *Commerson's dolphin*
10. *False killer whale*
11. *Killer whale*
12. *Risso's dolphin*

people, their nose is nowhere near their mouth. Instead, like other whales, they have a single nostril, or blowhole, behind their head.

Dolphins need to go back to the surface regularly to breathe.

Dolphins have front flippers but no hind flippers. Most species also have a fin on their back called a dorsal fin.

Most dolphins have their mouth stretched out into a long beak, which contains many pointed teeth. This mouth shape helps dolphins grab the slippery fish and squid on which most of them feed.

Dolphins also typically have a dome-shaped front to their head. Under the dome is an oil-filled structure called a melon. The melon helps focus the sounds that all dolphins make. Sound is extremely



DID YOU KNOW?



A dolphin's brain is larger than a human's!



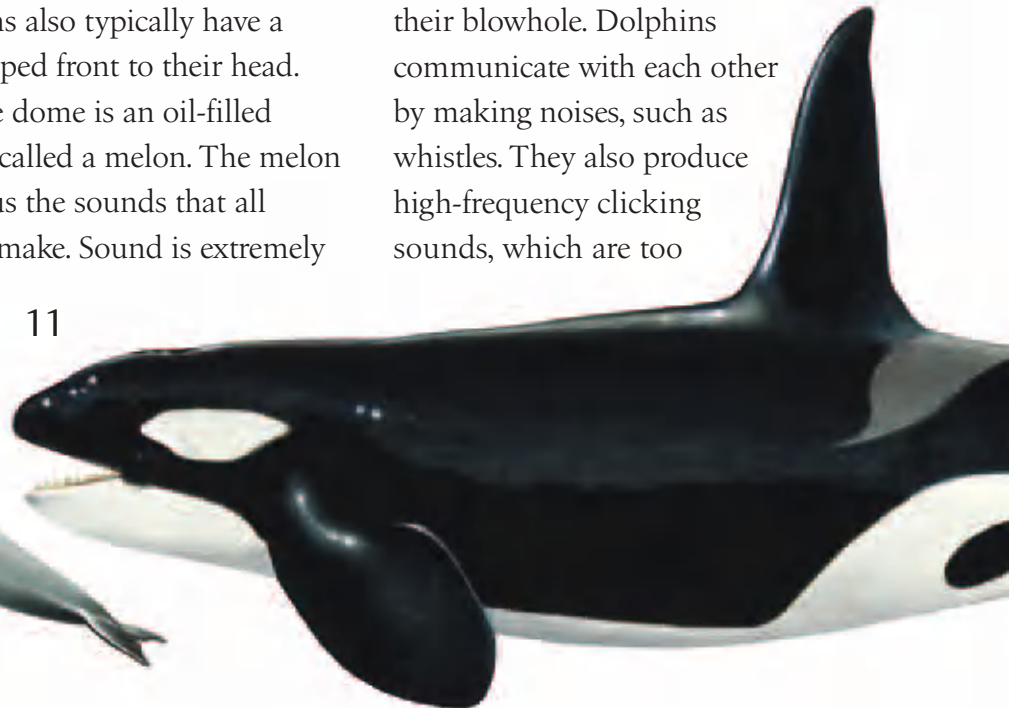
Groups of dolphins are called schools or pods.



Dolphins sometimes hold sponges in their mouths to protect their beak on coral reefs!

important to dolphins because sound travels better through water than light does. Dolphins have no voice box but produce sound by moving air in the tube leading up to their blowhole. Dolphins communicate with each other by making noises, such as whistles. They also produce high-frequency clicking sounds, which are too

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THE BIG ONE

The killer whale, also called the orca, is the largest member of the dolphin family. It lives worldwide in oceans. Males are bigger than females and have a much longer dorsal fin, up to 6 feet 6 inches long. Their black-and-white skin pattern varies, helping scientists recognize individual animals. That makes studying them long term much easier. Killer whales are unique among dolphins both in their diet and their social life.

DOLPHINS

high for people to hear. These clicks bounce off objects such as reefs or nearby fish. By listening to echoes, a dolphin can figure out where objects are and how large they are; the dolphin can “see” with its ears by this process, called echolocation.

Dolphins have good eyesight, even in dim light. They see well in both



RIVER DOLPHINS

The four species of river dolphins are each in their own family, separate from the ocean-going dolphin family, Delphinidae. River dolphins have a long, narrow beak and small eyes. Little is known about their social lives. The Yangtze River dolphin of China is the most endangered dolphin in the world. There are also at least two species of oceangoing dolphins that live in rivers.

DID YOU KNOW?



Killer whales sometimes catch seals by upending the ice that the seals are lying on!



Dolphins sometimes swim peacefully with tuna fish. They probably help each other watch out for sharks!

air and water. They can also taste but not smell because their blowhole is always closed underwater.

Habitats and Food

The world's oceans are a vast habitat. Some dolphin species live near coasts, while others inhabit deeper water. Some live worldwide, while others live in only one ocean. Sometimes various populations of the same species lead quite different lifestyles.

Deepwater dolphins sometimes make long journeys to look for food, often traveling in large groups. They use ocean-bottom features as landmarks to help them navigate. Dolphins living near coasts tend to stay in the same home area, but within that area they have regular patterns of movement. For example, dusky dolphins living off Argentina



▲ *Two bottlenose dolphins swim side by side as they hunt for fish in the clear ocean waters.*

spend the day feeding several miles out to sea. At night they usually come closer to shore, where there is less danger from sharks.

Most dolphins feed during the day, although spinner dolphins are mainly nighttime feeders. They also dive farther down from the surface to feed. They can therefore live in the same areas as other types of dolphins without competing for food.

Dolphins eat a wide variety of fish, squid, and other animal prey. They

probably eat whatever they can catch. Most species of dolphins catch prey that is swimming freely in the water. However, some dolphins nose around on the seafloor or coral reefs for food. The strong social bonds among dolphins help them cooperate for feeding. For example, a group of dolphins that comes across a shoal of fish may herd it to the surface by blowing bubbles and swimming around the fish. Once trapped at the surface, the fish are easier to catch and eat.

Killer whales are unique because they kill and eat other sea mammals, including the calves of larger whales. Sometimes they hunt in groups, sometimes alone. A killer whale will even launch itself up a beach to catch an unwary sea lion.

Social Behavior

Dolphins live complicated social lives, which vary from one species to another. Scientists still have a lot to learn about dolphin societies. Most species live in small groups, which may team up into larger groups, such as when rounding up a huge shoal of fish. Sometimes, thousands of deepwater dolphins may join forces to journey across the ocean.

DOLPHINS

Dolphins do not seem to be monogamous, with one male staying permanently with one female. Even small groups of dolphins may not always be permanent, with individuals switching from one group to another. However, dolphins are intelligent animals that can recognize other individuals, even if they have not seen each other for a while.

One of the whistling noises dolphins make is a so-called signature call. This call is different for each dolphin and helps other dolphins identify every individual. Sometimes two dolphins in a group may team up as buddies and stay

together for months or even years. Teamwork requires team bonding. Once dolphins have fed and rested, they spend a lot of time playing, socializing with, and touching one another. Often, they just seem to be having fun. These playful habits are probably a reason why dolphins are also friendly toward people.

Killer whales and probably pilot whales, too, live in more permanent groups than other dolphins. Killer whales live in groups containing a mother and all her offspring, including daughters, sons, grandsons, and granddaughters. Males leave the group temporarily to



DOLPHIN INTELLIGENCE

A dolphin's brain is larger than a person's, although a human brain is bigger relative to body size. Dolphins are obviously intelligent, as shown by their abilities to work together in groups and to learn new behaviors, both in the wild and in captivity. Tests show they can also think using abstract concepts, such as numbers. Sometimes people have tried to communicate with dolphins in artificial languages that use signs and symbols. Other people have doubted that dolphins are really able to use language in the way that people do.



▲ *A school of short-beaked common dolphins leaps out of the water at full speed.*

mate, but otherwise the family sticks together permanently, year after year.

Mother dolphins give birth to a single calf at a time. Most births take place during the summer months. The mother feeds it on her milk. The calf may stay for her for months or even years, depending on the species. A female dolphin has a calf only once every two or three years at most. For a female killer whale or pilot whale, births are seven to eight years apart.

Dolphins and People




Although dolphins are popular animals, human activities have sometimes had a bad effect on them. In the past, people killed dolphins for food, although that is less common now. In the late twentieth century,

nets spread in the ocean to catch tuna killed huge numbers of dolphins by accident. Nets are now designed to make it easier for dolphins to escape from or avoid.

Captive dolphins are popular, and dolphins seem to enjoy human company. However, some people think that it is unfair to keep dolphins in an unnatural environment. Certainly, dolphins in captivity die younger than wild ones.

Sometimes groups of dolphins, especially pilot whales, strand themselves on beaches, where they die. Possibly they are following a leader that has fallen sick. Strandings do not necessarily have anything to do with people. But some scientists think that pollutants may affect the health of dolphins, making sickness and strandings more likely.

DID YOU KNOW?

-  Two species of dolphins live in the Amazon River.
-  Some patterns on dolphins probably disguise them by imitating light patterns in water.
-  Dolphins have developed complex sound signals to stay in touch.

DORMICE

These small, agile mammals are experts at climbing bushes and trees to look for food. They are also famous for sleeping a lot. Some dormice spend more than half the year asleep.





Dormice are only distant cousins of true mice. Scientists think that squirrels are probably the nearest relatives of dormice. Just like squirrels, dormice have fur on their tail and are skillful climbers.

Dormice are mainly nocturnal (active at night). They have excellent hearing and large eyes that help them see well in the dark. Dormice eat fruit, nuts, seeds, and animal food, such as insects and spiders. They usually live together in small groups. Each group occupies a particular home range—an area in which the dormice search for food. Dormice do not live in the Americas, but some species are common in Europe, Africa, and parts of Asia. Other dormice species, such as the Japanese dormouse, are endangered.

Life Cycle and the Seasons

Dormice in colder regions hibernate, or sleep through the winter. A dormouse gets ready to hibernate by putting on weight in the fall and making itself a nest in a safe place, such as a tree stump. It then curls up into a tight ball. Dormice sometimes stay asleep for seven months or more. They may also go back into a deep sleep in the summer if food is in short supply.

Dormice start to breed as soon as they wake up in the spring. Before she gives birth, a mother dormouse builds a ball-shaped nest of leaves and grass above the ground to hold her babies. The young dormice are born blind and furless but develop quickly.

A dormouse finds a tasty blackberry to eat. In the fall, dormice fatten up on fruit and nuts, so they can survive their long winter hibernation without food.

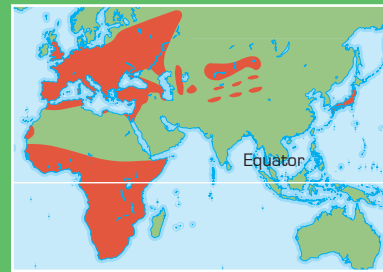
Fact File

DORMICE

Family: Myoxidae (26 species)

Order: Rodentia

Where do they live? Europe, Africa, and parts of Asia



Habitat: Mainly areas with trees and bushes

Size: Varies with species; head-body length 2.5–7.5 inches (6–19 cm); weight: 0.5–7 ounces (14–200 g)



Coat: Brown to gray, soft fur; bushy tail

Diet: Fruit, seeds, nuts, insects, and worms

Breeding: Females give birth to an average of 4 offspring after 21–32 days' gestation; offspring leave nest after 4–6 weeks; breed at 1 year old

Life span: 3–6 years in the wild

Status: Half of all dormouse species are endangered



DUGONG AND MANATEES

Dugongs and manatees are the only large, water-living mammals that eat plants. They are sometimes called sea cows. People have suggested that these gentle animals might be the origin of stories about mermaids!





At first glance, dugongs and manatees look a bit like small whales. However, scientists think that their nearest living relatives are elephants. Dugongs and manatees are also called sirenians, after the name of the scientific order to which they belong—Sirenia. The dugong lives only in warm, shallow seas; manatees also live in freshwater.

Streamlined Shape

Like whales, sirenians have a streamlined shape for swimming and flippers instead of front legs. They also have a layer of blubber, or fat, under the skin, which helps them keep warm. The easiest way to tell the difference between a dugong and a manatee is to look at the tail. Manatees have a roundish, paddle-shaped tail. By contrast, a dugong's tail is forked, just like a whale's.

Sirenians' sense of touch is good, especially around their mouth, where they have many sensitive bristles. They use the bristles to help find the

A West Indian manatee cruises the warm, shallow waters of the Caribbean. It has large, flexible lips that help it feed on water plants.

Fact File

Dugong dugon (dugong), Trichechus manatus (West Indian manatee), Trichechus senegalensis (West African manatee), and Trichechus inunguis (Amazonian manatee)

Families: Dugongidae and Trichechidae

Order: Sirenia



DUGONG

Where do they live? Tropical sea coasts, from East Africa to Australia

Habitat: Shallow seas where sea grasses grow

Size: Length 3 feet 4 inches–13 feet (1–4 m); weight 500–2,000 pounds (230–900 kg)



Skin: Smooth, brown to gray, with a few bristles

Diet: Sea grasses

Breeding: Females give birth to 1 calf every 3–7 years

Life span: Around 60 years

Status: Vulnerable

MANATEES

Where do they live? Florida, the Caribbean, northern South America, and western Africa

Habitat: Shallow coasts, river mouths, and freshwater

Size: Depends on species; head–body length 8–15 feet (2.5–4.6 m); weight 770–3,500 pounds (350–1,600 kg)

Skin: Grayish and hairless; Amazonian manatee has a pink patch on belly

Diet: Freshwater plants and sea grasses

Breeding: Females give birth to 1 calf every 2–3 years

Life span: 30 years or more

Status: Vulnerable

DUGONG AND MANATEES

1. *Steller's sea cow*
(now extinct)
2. *Amazonian manatee*
3. *West Indian manatee*
4. *Dugong*
5. *West African manatee*

plants they feed on. Sirenians also have good hearing, even though they have only tiny earholes. Their eyesight is not so good. Like all water-living mammals, they have to come to the surface to breathe.

Muscular Lips for Feeding

Sirenians have large, muscular lips, which they use to grab and pull at the water plants they feed on and to root around in mud at the bottom of

shallow seas for food. Dugongs and manatees eat sea grasses. These plants grow underwater in warm, shallow seas. Sea grasses are true flowering plants, unlike seaweeds.

Manatees also eat freshwater plants. These plants are tougher to eat than sea grasses. Manatees have stronger teeth than dugongs. A manatee's teeth are replaced throughout its life because the plants it eats wear them down.

Plants are not easy to digest. Sirenians have bacteria (microscopic life-forms) living inside their digestive system. The bacteria help digest the plant food. Manatees have an intestine that is 150 feet long.

Social Life and Breeding

Sirenians often gather together where there is food or warm water. Despite this, these animals do not seem to be social. However, scientists still have a great deal to learn about their behavior. For example, sirenians make chirping noises and squeaks to each other, but experts do not yet know what they are saying.

At breeding time, male dugongs gather together to show off in front of female dugongs. A female chooses the male she likes best.





STELLER'S SEA COW

Until the 1700s, a huge dugong relative called Steller's sea cow lived in the northeast Pacific Ocean. It weighed up to 6 tons. Steller's sea cow ate a large seaweed called kelp, not sea grasses. However, sailors passing by discovered Steller's sea cows and started hunting and killing them for food. Within a few years of its discovery, Steller's sea cow was extinct.

Unlike manatees, male dugongs have a pair of short tusks, which may play a part in courtship. Male manatees do not show off, but sometimes several males chase after a single female at the same time.

Sirenians, especially dugongs, breed slowly. A female dugong is not ready to breed until she is ten years old. In both dugongs and manatees, a calf stays close to its mother for one or two years before setting off on its own.

Habitats and Survival

Dugongs and manatees live in different parts of the world. Dugongs

live only in the sea, while West Indian and West African manatees move between saltwater and freshwater habitats. The smallest species of manatee, the Amazonian manatee, lives only in freshwater. It eats floating plants in the Amazon river in South America and the smaller rivers that flow into it.

Sirenians are slow-living animals that have few natural enemies. Humans are now the main threat to them. In Florida, many West Indian manatees are injured or killed by boats and boat propellers. Pollution also damages these animals. There are now safe, boat-free zones for manatees off the Florida coast.

Dugongs have often been hunted. They are rare or extinct in many places. However, in the seas off northern Australia there are still plenty of dugongs. Scientists are now studying these animals to understand their lives better.

DID YOU KNOW?



The nearest relatives of dugongs and manatees are elephants!



People use manatees to eat weeds in artificial water channels to keep them clear!



Manatees relax by lying upside down on the seabed!

DUIKERS

Duikers are small- to medium-sized hoofed antelope living in Africa. Their unusual name means “divers.” If something scares them, they dive into the nearest clump of trees or bushes.





Duikers are antelope—wild relatives of cows and sheep. At least seventeen species live in Africa. Except for one species, the bush duiker, or common duiker, all duikers live in thick forests. That makes these mammals difficult to study in the wild.

Duiker species vary a great deal in size and coat color. For example, the zebra duiker has eye-catching black stripes across its back. The smallest species is the blue duiker; an adult weighs only 9 pounds. But the yellow-backed duiker can reach 176 pounds. All duikers have short, straight, backward-pointing horns. Usually, only the male common duiker has horns. In other species, the females also have horns.

Duikers browse on trees and bushes, eating leaves, shoots, fruit, buds, and bark. The blue duiker also likes eating ants. The rarest species is called Ader's duiker. It lives in only a few places in East Africa. One problem for duikers is that people like eating them—many are killed and sold as bush meat.

Claiming a Territory

Like most forest-living mammals, duikers do not live in large groups. Usually only a single male and female live together. They take over a patch of forest as their territory and defend it against other duikers. One way in which duikers claim their territory is by marking it using scent glands below their eyes. They rub this scent onto nearby landmarks, such as tree stumps.

Large ears and eyes help this common duiker detect any nearby predator. Compared with other antelope, duikers have a large brain for their body size.

Fact File

DUIKERS

Family: Bovidae; subfamily Cephalophinae (16 species of forest duikers; 1 species of common duiker)

Order: Artiodactyla

Where do they live? Africa, south of the Sahara desert



Habitat: Mainly forests or areas with thick undergrowth

Size: Varies with species; head-body length 22–57 inches (59–145 cm); weight 9–176 pounds (4–80 kg)



Coat: Often reddish, but in some species blue-gray, black, or striped

Diet: Leaves, fruit, buds, seeds, and bark; occasionally small animals

Breeding: 1 calf born at a time

Life span: Unknown in the wild; 10–15 years in zoos

Status: Jentink's duiker, Abbott's duiker, and banded duiker are listed as vulnerable; other species are least concern or near threatened

ELEPHANTS

Elephants are the largest land animals on Earth. Their huge tusks are extra-large incisor teeth. These animals are highly intelligent and have complex social lives.





There are three species of elephants: the African savanna elephant, the African forest elephant, and the Asian elephant. Asian elephants are smaller than African elephants. They also have a more domed head, an arched back, and much smaller ears. African forest elephants are smaller than the better-known African savanna elephants. Forest elephants also have straighter tusks and rounder ears.

Body Design

Elephants are amazing animals. Many of their unique features are connected with their huge size. Unlike other large plant eaters, elephants cannot reach down to the ground with their mouth. Instead, they rely on their trunk to grab food (see the box overleaf). An elephant's trunk is equivalent to the nose and upper lip of other animals.

Elephants stand with their legs held straight like pillars to support their weight. They usually walk slowly, but they can also charge quickly. Elephants' feet are large, round, and rough on the bottom, which helps them grip the ground. The toes and toe bones are hidden inside the foot. Each foot contains a large pad of fatty material, which helps spread the elephant's weight and acts as a shock absorber.

Elephants have excellent senses of hearing and smell. Their enormous ears also act as radiators, helping the elephant get rid of excess heat from its body.

African savanna elephants browse among the bushes. Scientists think there may be up to 600,000 African elephants and 57,000 Asian elephants in the wild.

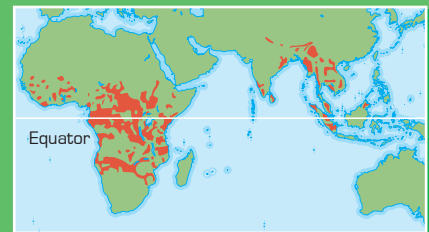
Fact File

ELEPHANTS

Family: Elephantidae (3 species)

Order: Proboscidea

Where do they live? Africa south of the Sahara desert (African savanna elephant); central and western Africa (African forest elephant); South Asia and Southeast Asia (Asian elephant)



Habitat: Varied, including savanna grasslands, bushlands, and woodlands

Size: Male African savanna elephant, shoulder height 10.8 feet (3.3 m), weight up to 6.5 tons (6 metric tons)



Coat: Thick dark gray to brown skin

Diet: Mainly grass, also leaves, wood, flowers, fruit, crops

Breeding: 1 calf born after 615–668 days' gestation

Life span: Savanna elephant 60 years in the wild (more than 80 years in captivity); Asian elephant 75–80 years in captivity

Status: African elephants are vulnerable; Asian elephants are endangered

ELEPHANTS

An elephant's head is huge, even compared with the rest of its body, and its brain is also large. An elephant's huge skull supports its trunk, tusks, and jaw muscles. The bones of the skull have air spaces to make them lighter.

An elephant's tusks are overgrown upper front teeth (incisors). Elephants use their tusks to dig for water, to get bark off trees to eat, and sometimes for fighting. Their tusks grow throughout life. In Asian elephants, usually only the males have tusks.





Habitats and Diet

Elephants need a lot of food and water, and they have to know where to find them. Many places in which elephants live have wet and dry


seasons. Elephants change their feeding habits to match these different seasons. They also live for a long time and have a good memory, so remember the best places to find food at different times. The size of area that a group of elephants uses, called a home range, varies greatly. In desert areas, elephants may range over thousands of square miles.


Elephants eat only plants. During the wet season, African savanna elephants eat a lot of grass. In the dry season they eat more twigs, bark, and branches from trees and bushes. They even push over trees to get at their leaves. Elephants living in lush forests eat more leaves and fruit. Elephants have a huge digestive system that processes all their bulky, rough food.

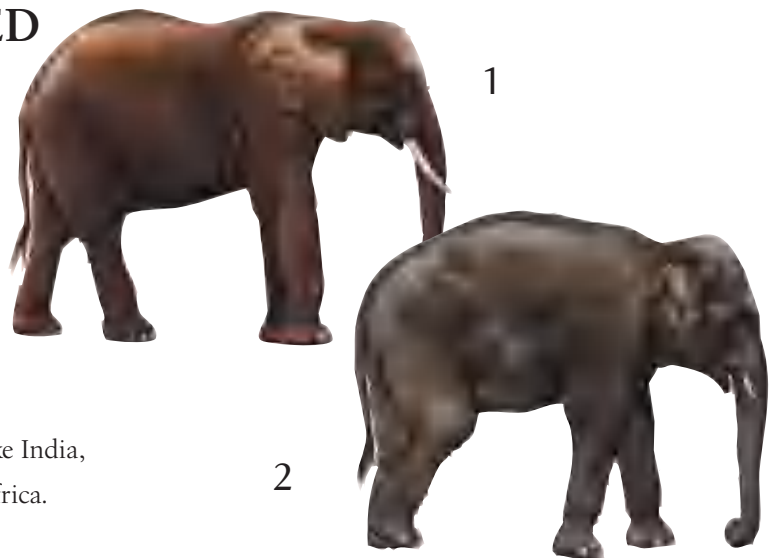
DID YOU KNOW?

-  If an elephant gets hurt, other elephants try to help and support it.
-  Elephants have the largest brain in the animal kingdom!
-  Elephant skin can be up to 1.5 inches thick!
-  An elephant sometimes scratches itself with a stick held in its trunk!

ELEPHANTS COMPARED

 1 The African savanna elephant is larger than the Asian elephant. It also has a curved back and bigger ears. The African savanna elephant is an average of 10.8 feet at the shoulder and weighs 6.5 tons.

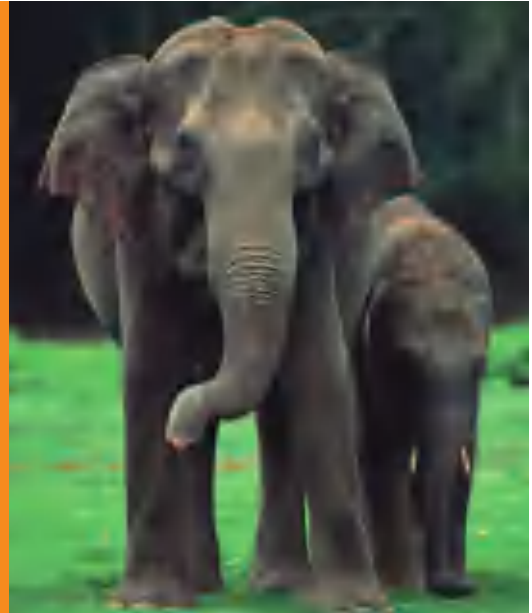
 2 An Asian elephant measures an average of 8–10 feet at the shoulder and weighs 6 tons. Asian elephants are said to have ears shaped like India, while African elephants' ears are shaped like Africa.





TRUNKABILITY

An elephant's trunk is strong, muscular, and incredibly versatile. It is used to grab food and put it in the elephant's mouth and also to suck up water. An elephant also smells and breathes through its trunk, which it can hold up as a snorkel when swimming. An elephant can pick up heavy tree trunks as well as tiny twigs using fingerlike lips at the end of the trunk. An Asian elephant has one lip, while African elephants have two. Elephants greet and stroke each other with their trunks, too, and make their famous trumpeting noises through them.



Apart from tusks, elephants also have one upper and one lower tooth on each side of their mouth. Each one is a huge grinding tooth, or molar. When the teeth wear down, another set replaces them, but each elephant has only six sets altogether. Old elephants sometimes die of starvation because they run out of teeth with which to eat.

Social Life and Behavior

Elephants are extremely social animals. Female African and Asian elephants and their offspring live together in small social groups. An older female, called a matriarch,

usually leads each group. Group living helps elephants pass on important knowledge, such as the location of water holes. Also, if danger threatens, adult elephants form a circle, tusks outward, to protect the youngsters in the middle. Predators are much more likely to attack baby elephants than adults.

When young females mature, they usually stay in their own group, or sometimes one group splits into two. When young males grow up, they leave or are forced away from their original group. Adult males live separately from females, either in all-male groups or by themselves.

▲ *An African savanna elephant stands guard over her calf. At birth, an elephant calf weighs around 220 pounds.*

ELEPHANTS

Communication is very important for elephants. They show their moods by how they hold their head, ears, and trunk. Elephants also touch each other with their trunk to show friendship or as part of mating behavior. They use sound a great deal, sometimes using deep sounds that people cannot hear. Elephants can communicate over miles in this way. As well as traveling through the air, the sound also goes through the ground. Scientists think that elephants' feet help pick up ground vibrations, which pass up through their body to their ears.



Elephants show an amazing interest in other elephants that have died. They often revisit the bodies, sniff them, and even carry their bones on their head. This behavior is still a mystery to scientists.

Breeding and Life Cycle

A female elephant does not breed often. If she becomes pregnant and has a calf, she will not be ready to breed for another five years. A fertile female calls males from miles around using deep, low-frequency sounds. Sometimes the males fight, but that does not guarantee that the winner will become the father. Females are choosy about who they mate with.

1. *The elephant ancestor Moeritherium lived around 34 million years ago (mya).*
2. *Trilophodon lived 24–1.8 mya.*
3. *Then came Platybelodon, which lived around 12–5 mya.*
4. *The largest ever elephant ancestor was the imperial mammoth, which lived around 1.6 mya.*
5. *The present-day African savanna elephant is much smaller than the mammoth.*

DID YOU KNOW?

-  Elephants can learn to turn faucets on and off with the lips at the end of their trunk!
-  Some people think that elephants cry tears when they are sad!





ELEPHANT ANCESTORS

Scientists think that elephant ancestors evolved in Africa when that continent was a large island unconnected to the rest of the world. Millions of years ago, many different long-nosed elephant relatives roamed the world. One was the woolly mammoth, which lived during the last ice age, up to 10,000 years ago. It had long hair to stay warm.



Elephants are pregnant for nearly two years. When the calf is born, it needs help from its mother for up to ten years. Other females in the group also help look after the calf. Elephants live for around sixty years in the wild, and can reach eighty in captivity.

Elephants and People

In Asia there is a long tradition of capturing young elephant calves and rearing them in captivity. People have used tame elephants to pull logs through forests, as part of religious ceremonies, to perform in circuses, and even to ride into battle on.

In the last 150 years or so, human actions have reduced the number of elephants. Many elephants have been killed for their ivory, the white material from which their tusks are made. The ivory is carved into jewelry and even piano keys. Since 1989, trade in products made from elephants has been banned. However, poachers (illegal hunters) still kill many elephants. Habitat destruction by people also threatens elephants. In some protected national parks, however, there can be too many elephants because each one needs so much space and food.

▲ *Woolly mammoths are probably the best-known animals of the last ice age. Many carcasses have been found in frozen ground in Siberia.*

ETHIOPIAN WOLF

This long-legged wolf lives only in the mountains of Ethiopia in northeastern Africa. It is the rarest member of the dog family. Scientists are working with local people to try to stop the species from becoming extinct.





The Ethiopian wolf is closely related to the gray wolf, but looks more like an overgrown fox. It has large ears, long legs, a narrow, pointed snout, and small, widely spaced teeth. These features help the wolf catch its main prey—rodents such as rats and mice. Ethiopian wolves usually hunt by day alone. Sometimes they team up to hunt larger animals, such as antelope.

The Ethiopian wolf lives mainly in cool, treeless grasslands, high up in the mountains of Ethiopia, but now only in a few small, separate areas. There are probably only around 500 adults left in the wild.

People have helped make this wolf rarer. For example, farmers are taking over more of the Ethiopian highlands, which leaves less space for the wolves. These wolves also catch a deadly disease called rabies from domestic dogs. Scientists are trying to help prevent this.

Complex Societies

Ethiopian wolves live in well-organized groups, or packs, although they usually hunt alone. Each pack can include up to thirteen adults plus cubs. One advantage of living in a pack is that the wolves are able to defend their home territory against neighboring wolves. Good grassland habitat contains plenty of prey and is worth defending. Pack members work together to scent mark their territory every day by leaving their droppings and urine at the boundaries and by scratching. That helps warn off greedy neighbors.

A pack of Ethiopian wolves stays alert for prey and rival packs. Most of the adults in a pack are male, although there is one dominant female that breeds.

Fact File

ETHIOPIAN WOLF

Canis simensis

Family: Canidae

Order: Carnivora

Where do they live? Highlands of Ethiopia in eastern Africa



Habitat: Grasslands and heathlands above 10,000 feet (3,000 m)

Size: Head-body length 33–40 inches (84–100 cm); weight 24–44 pounds (11–20 kg)



Coat: Mainly reddish brown, with white on belly and neck

Diet: Mainly rodents

Breeding: Gestation 60–62 days; 2–7 pups per litter; born October–December; fed by pack until 6 months old; only the dominant female in the pack usually breeds

Life span: Up to 11 years

Status: Endangered

FLYING FOXES

Flying foxes are large bats. Their foxlike faces are quite different compared with those of most other bats. That is connected with the different way in which they search for food.





Flying foxes are the largest bats in the world. They belong to a family called fruit bats. Unlike most bats, fruit bats eat flowers and fruit instead of chasing night-flying insects. Flying foxes find their food by sight and smell and do not use echolocation. They live only in the warmer parts of Asia, Australia, and islands of the Indian Ocean and western Pacific Ocean.

Sometimes the term “flying fox” is used for all fruit bats, but usually people mean just the larger species that belong to the genus (group) *Pteropus*. As in all bats, the wings of flying foxes are made of skin stretched between the arm and finger bones, which are very long and thin. Flying bats are most active at dusk, when they can still see. When they are not active, they roost by hanging upside down in trees, holding on by their feet. Such roosts can contain thousands of bats.

Long-distance Travelers

Flying foxes play an important role by helping pollinate the flowers of many types of trees. Also, when the bats eat tree fruit, the seeds often pass through the bat’s body unharmed. Flying foxes travel long distances, so the seeds are often spread far and wide.

Flying foxes are powerful fliers. Some species are migratory—they make regular long-distance trips at certain seasons, sometimes traveling hundreds or thousands of miles. Scientists are now studying their movements using satellite tracking.

A flying fox hangs upside down from a tree. Its long, thin arm and finger bones support the skin that forms the bat’s wings. Bats are the only mammals that fly.

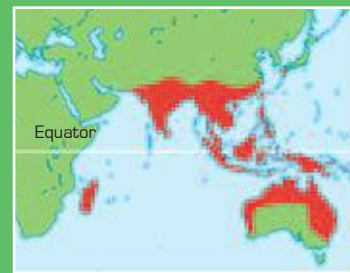
Fact File

FLYING FOXES

Family: Pteropodidae (more than 60 species in the genus *Pteropus*)

Order: Chiroptera

Where do they live? South Asia, Australia, and islands of the Indian Ocean and western Pacific Ocean



Habitat: Forested areas; some populations live in towns and cities

Size: Wingspan up to 5.5 feet (1.7 m); weight up to 3.5 pounds (1.6 kg)

Coat: Color of fur varies among species

Diet: Flower nectar, pollen, and fruit

Breeding: Varies with species

Life span: Varies with species

Status: Many species threatened; Ryukyu, Nicobar, white-winged, and Marianas flying foxes are endangered; Chuuk, Comoros, Caroline, and Rodrigues flying foxes are critically endangered

FOXES

Foxes are clever, resourceful members of the dog family. One species, the red fox, probably has the largest natural range of any land mammal, apart from people.





Foxes are smaller than other members of the dog family, such as wolves and coyotes. The head of a fox is also flatter, with a narrow, pointed muzzle, or snout. The narrow muzzle helps foxes root out and snap up smaller prey. Foxes also have large ears and a big, bushy tail. Of the thirty-six species in the dog family, twenty-three are foxes. The smallest is the tiny fennec fox, at just 9.5 inches from nose to rump. It lives in the deserts of North Africa. Fennec foxes have huge ears, which act as radiators when the foxes get too hot. The small-eared dog is the largest fox. It measures 39 inches from nose to rump.

The gray fox of North America is unusual because it often climbs trees. The small arctic fox survives in the freezing lands near the Arctic Ocean. The fox's thick, furry coat often turns white in winter.

Food and Survival

The red fox is the most familiar species of fox to people living in North America and Europe. Its coat is usually bright reddish brown, although gray and dark forms also occur. The red fox lives successfully in towns and cities. It eats just about anything it can get hold of, from small mammals and birds to worms, insects, fruit, and garbage. Just as other foxes do, the red fox usually hunts for food by itself, not in groups or packs. It often creeps up stealthily on prey and pounces from above when it gets close enough. It also stores food for later

A red fox curls up to go to sleep, using its thick, bushy tail as a scarf to keep warm. Red foxes have a slender muzzle with white lips, and large, pointed ears.

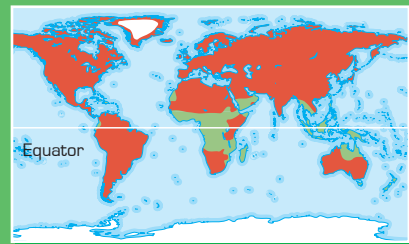
Fact File

FOXES

Family: Canidae

Order: Carnivora (23 species, including gray fox, red fox, arctic fox, and fennec fox)

Where do they live? Europe, Asia, Africa, North and South America; red fox introduced to Australia



Habitat: Forests, scrublands, grasslands, tundra, towns, and cities

Size: Varies with species; head-body length 9.5–39 inches (24–100 cm); weight 2.2–20 pounds (1–9 kg)



Coat: Usually thick fur; coat color depends on species

Diet: Almost anything, from birds and small mammals to earthworms, fruit, and garbage

Breeding: Usually 1–6 cubs per litter

Life span: Up to 6 years in the wild; 13 years in zoos

Status: Not threatened



FOXES

use in larders that it digs in the ground. Over the centuries, millions of red foxes have been hunted for their fur or shot by farmers. Despite this, red foxes are still common.

Other fox species need more help, however. For example, the swift fox, a small fox native to the Great Plains of North America, became extremely rare during the twentieth century. Conservationists helped stop it from becoming extinct and now the swift fox is more common again. Another endangered fox is Darwin's fox. It lives in Chile in South America. Only a few hundred animals are now left.

Family and Social Life

Foxes do not live in packs, as wolves do. Foxes are usually monogamous—a single male and female live together. Some species live in small groups, in

DID YOU KNOW?



Foxes sometimes paddle in water looking for fish to catch!



The island fox lives only in the Channel Islands of California.



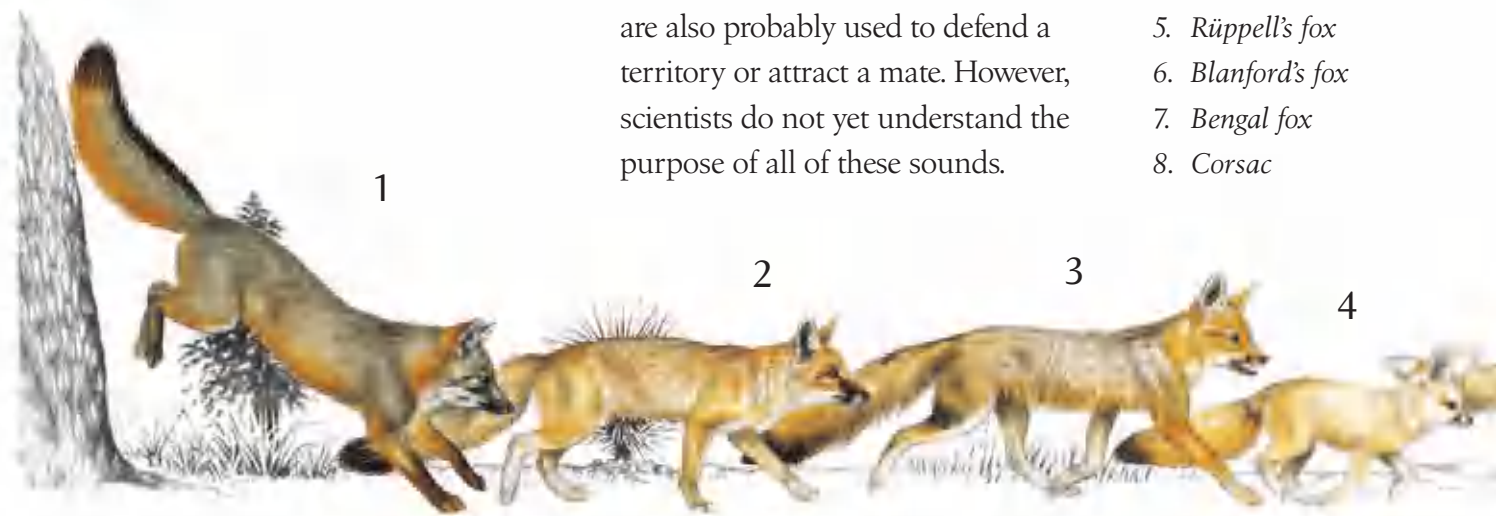
Fennec foxes use their enormous ears as radiators, to lose heat!

which relatives help look after the cubs. A fox normally has a home range—an area it patrols for food. A home range is also usually a territory; the owners defend it from other foxes. A pair or group of foxes lay down scent marks on the ground using their urine and feces to mark ownership of their territory.

Communication

Foxes make many different sounds, including yapping, barking, howling, and screaming. Some of these noises are also probably used to defend a territory or attract a mate. However, scientists do not yet understand the purpose of all of these sounds.

1. *Gray fox*
2. *Swift fox*
3. *Cape fox*
4. *Fennec fox*
5. *Rüppell's fox*
6. *Blanford's fox*
7. *Bengal fox*
8. *Corsac*





FOX EVOLUTION

Although foxes belong within the dog family, they are not all closely related to each other. For example, the gray fox of North America has only one close relative among other foxes. Scientists believe that, over millions of years, several different branches of the dog family evolved to look like present-day foxes. Most foxes of Africa and Asia, such as this cape fox (right), are related to the red fox and the arctic fox. By contrast, the foxes of South America are more closely related to wolves than to other foxes.






Births in Spring

Foxes breed once a year, generally in the spring. The mother gives birth to her cubs in a den, usually a burrow or other safe place. The cubs are born blind and helpless but they grow fast. They are safe to leave the den after a few weeks.

Young foxes are very playful, especially when they practice their hunting skills on their brothers and

sisters. In the fall, young foxes are fully grown and usually leave their parents to find their own territory.

DID YOU KNOW?

-  Clever foxes feature in folktales in many parts of the world!
-  Red foxes can pull earthworms out of the ground without breaking them!
-  The bat-eared fox of Africa feeds almost entirely on insects!



GAZELLES

Gazelles are among nature's supreme athletes. They have speed, agility, and grace as well as sharp senses always alert to danger. All of these features are essential to help them stay one step ahead of their many predators.





Gazelles are the most graceful members of the cattle family. They are slender animals, with long, slim legs, a long neck, and an elegant, narrow face. Gazelles live in grasslands and on dry plains, where there is very little shelter and few places to hide from predators. Most of the distinctive features of gazelles help them survive in these open spaces.

Most gazelle species live in large groups called herds. Some herds contain hundreds or even thousands of gazelles. With many pairs of eyes and ears always checking for danger, it is extremely difficult for even the stealthiest predator to sneak up. Gazelles have large eyes that are set on the sides of the head and bulge out slightly. So, a gazelle can see to either side without having to turn its head. Gazelles have long eyelashes, which shade the eyes from the bright sun and collect dust that drifts down from the air. Gazelles also have large ears, which can turn to the sides and even backward. The ears are furry on the backs and on the insides to protect them from sunburn and from dust.

Speedy Runners

Gazelles are famous for their speed and nimbleness. Most gazelles can run fast and, if they are being chased, they can change direction in an instant. By dodging from side to side, gazelles can even escape the fastest hunter of all, the cheetah, which can reach top speed only by running in a straight line.

A springbok displays its characteristically curved horns. These graceful gazelles live in the dry, open plains of southern Africa, as far north as Angola.

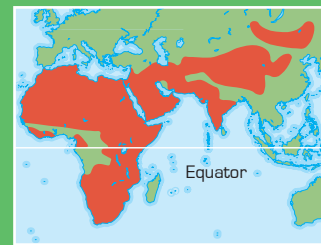
Fact File

GAZELLES

Family: Bovidae; subfamily Antilopinae
(more than 30 species)

Order: Artiodactyla

Where do they live? Africa, the Middle East, and parts of southern and central Asia



Habitat: Forests, savanna and steppe grasslands, deserts, and rocky landscapes

Size: Head-body length 18–68 inches (45–172 cm); weight 3.3–188 pounds (1.5–85 kg); females larger than males



Coat: Short and neat; coarse or silky; color and markings vary with species; most offer some camouflage

Diet: Grass, herbs, leaves, shoots, buds, and fruit of various shrubs and trees

Breeding: 140–225 days' gestation; single offspring; saiga often has twins

Life span: 10–18 years, depending on species and living conditions

Status: Around one-quarter of all gazelle species are vulnerable or endangered, some critically so

GAZELLES

🕒 *A small herd of Thomson's gazelles gathers to eat and drink at a water hole, remaining alert for predators.*

DID YOU KNOW?

- 🐾 The royal antelope is the smallest member of the gazelle group—about the size and weight of a house cat!
- 🐾 Springbok were once so common that their migrating herds stretched for miles!
- 🐾 The saiga is the only gazelle that regularly has twins.

Locking Horns

The horns of most gazelles are not straight or smooth. Usually they are ringed with ridges and curve from the base to the tips to form an “S” shape, a “C” shape, or a spiral.

Along with their horizontal ridges, these horn shapes allow rival gazelles to lock horns firmly in combat. Male gazelles lock horns to test each other's



KEEP ENEMIES CLOSE

Thomson's gazelles (above) have a surprising way of dealing with predators—they follow them. If a member of a herd of Thomson's gazelles spots a lion, hyena, or wild dog, it sounds the alarm, and the

whole group turns to face the danger and begins to walk toward the predator. The gazelles are careful never go close enough to be in real danger. With the element of surprise lost, the predator has to slink away.



1. Dibatag in alarmed posture.
2. Goitered gazelle
3. Springbok, pronking
4. Tibetan gazelle
5. Slender-horned gazelle
6. Dama gazelle,
the largest gazelle
7. Oribi, marking a stem
with its ear gland
8. Steenbok, scent marking
with its facial gland
9. Blackbuck, in territorial
display pose

and they use them to challenge each other for food and territory.

Scent Marking

Scent is important to most gazelles. These animals have an excellent sense of smell, and most gazelles produce scent from glands in the face (orbital glands) and the feet (pedal glands). Gazelles also release scent into their droppings. Male gazelles use dung piles to mark their territory and add fresh droppings regularly. Any intruder will know immediately that the area is already occupied.

strength without there being a serious risk of them getting hurt. It soon becomes clear which gazelle is the strongest, and the loser backs off without suffering anything worse than hurt pride. In most species, both male and female gazelles have horns,

GAZELLES



A SPRING IN THEIR STEP

The springbok is named for its habit of leaping high into the air, usually with all four legs locked straight. Stretchy leg muscles and tendons absorb the energy of each bounce with each landing and catapult the animal up into the air again. Lots of other gazelles use the same trick, which is called pronking or stotting. Pronking is a way of raising the alarm, while at the same time allowing the gazelle to get a good look around. This activity probably also confuses a predator because it can be difficult to predict which way the gazelle will leap next.

Grazers and Browsers

Gazelles are herbivores, or plant eaters. Species such as springboks and Thomson's gazelles graze on fresh grass, and they are able to smell rain from many miles away. They travel long distances to find good, fresh pasture. Other species eat the leaves and shoots of trees and shrubs. This way of eating is called browsing.

The gerenuk is a long-legged, long-necked species. It has a neat trick to help it reach higher branches than any other gazelle species—it can stand and walk on its hind legs.

Dwarf Antelope and Dik-diks




There are eighteen species of gazelles, living in Africa and Asia. Dwarf antelope and dik-dik, close relatives of gazelles, are small and usually live in forests or more wooded habitats only in Africa. Often, they live alone or in pairs rather than in large herds. Only dwarf antelope males usually have horns. Some species, such as oribis, klipspringers, and steenboks, have short, straight, and smooth horns. These horns are stabbing weapons. These animals are more aggressive than gazelles and can kill each other when they fight.



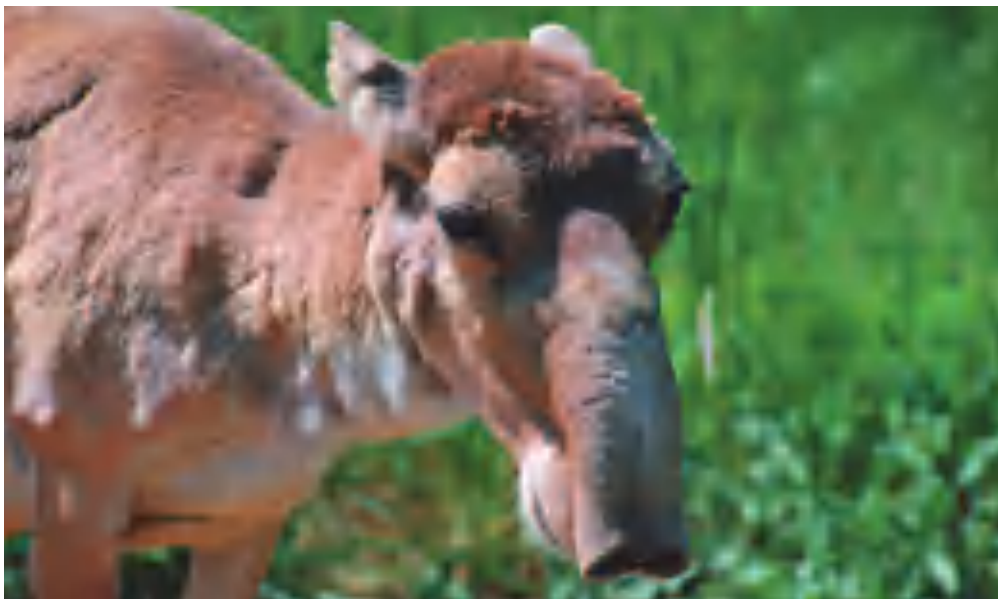
The Hardy Saiga


The last member of the gazelle group, the saiga, looks like the odd one out. Its legs are short and its body is stout and clumsy looking. Instead of a small, fine-featured face, it has a large head with a Roman nose and a short, floppy trunk. Saigas live on the open steppe and stony deserts of central Asia and Mongolia. Life is tough here, especially in winter when temperatures reach -72°F (-40°C) and the wind is fierce. The saiga's unusual fleshy nose warms the air the animal breathes in, so the lungs do not become chilled. The bleak plains offer little cover, and so, as gazelles do, saigas rely on safety in numbers and speed to save them from predators such as wolves.

DID YOU KNOW?

-  White fur is best at reflecting heat and so gazelles often stand with their white rump turned toward the sun.
-  A springbok can leap up to 10 feet into the air, from a standing start!
-  The gerenuk can survive without drinking water!

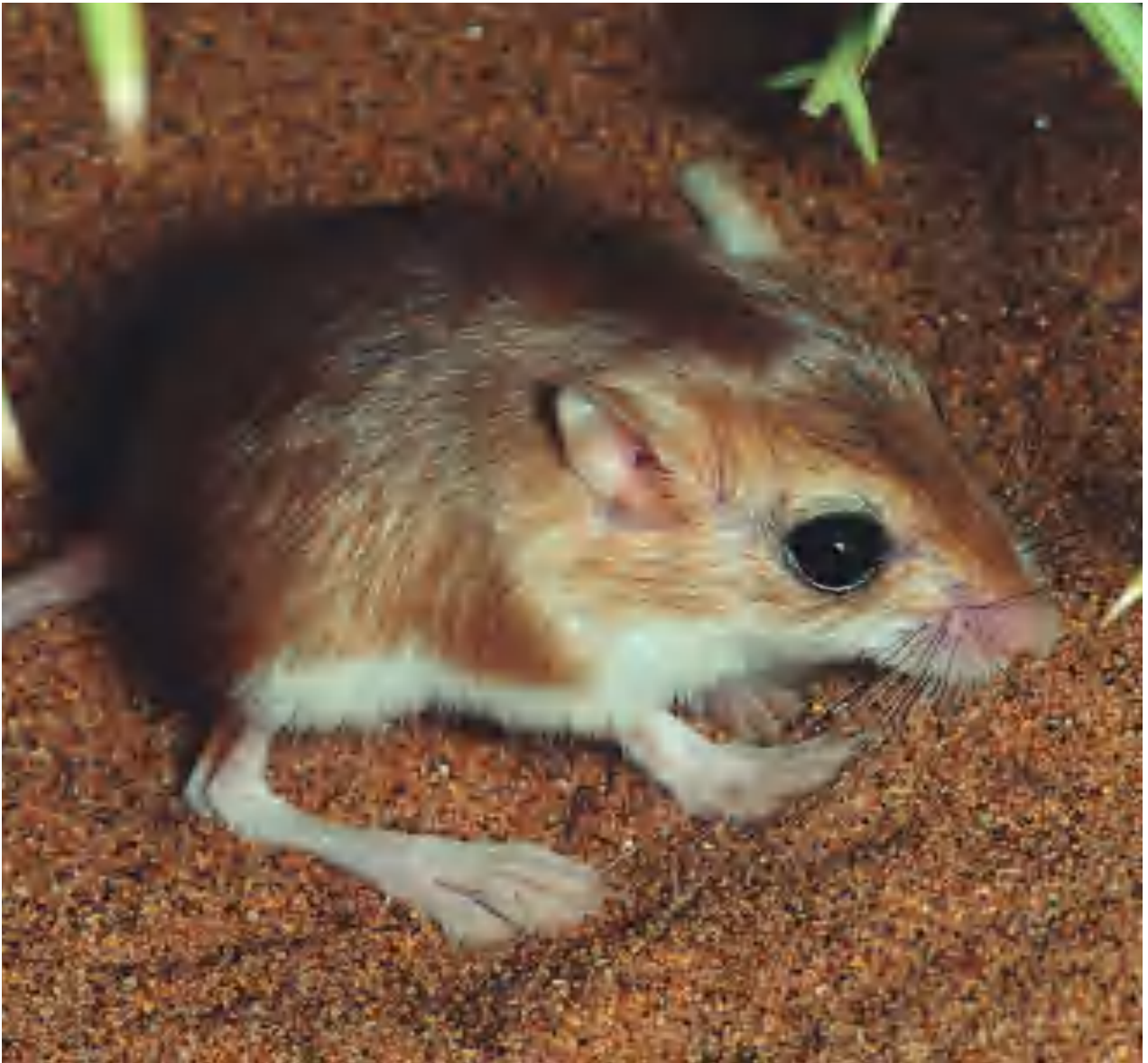
Despite its ungainly looks, the saiga is one of the fastest runners on Earth. It can sprint at up to 50 miles an hour over the flat plains—fast enough to outrun most predators. Saigas are hunted for their horns. So many animals have been killed that the species has already become extinct in many countries and is now listed as critically endangered.



 Unlike other gazelles, the saiga has a large, fleshy snout. Saigas live in cold areas, and their unusual nose helps warm the air before it reaches the lungs.

GERBILS

The Mongolian gerbil is much loved as a pet all around the world, but its wild cousins lead a much tougher life in the deserts and dry grasslands of Africa and Asia. Several species of gerbils are threatened with extinction.





Gerbils and their relatives, sand rats and jirds, are rodents. Most of these animals live in hot deserts or dry grasslands, where there is very little food and water and where predators, such as foxes, snakes, and birds of prey, are always on the lookout for an easy meal. These difficult conditions mean that gerbils have evolved some interesting features. To begin with, they hardly ever need to drink. There is a small amount of water in the seeds and roots they eat; gerbils manage to make this last by not sweating and producing just a few drops of urine a day. On hot days, gerbils stay in their burrows. Most species live in hot deserts, so they are active only at night.

Avoiding Predators

After saving water, the next most important thing for gerbils is to avoid predators. A gerbil's fur provides excellent camouflage and usually matches the sand in the place where it lives. Some gerbils have a tuft of black fur at the end of the tail. This tuft stands out clearly when the gerbil moves and probably distracts predators, making them grab the gerbil's tail rather than its body. This gives the gerbil a chance to escape. Gerbils also use the tail tuft to sweep sand over their burrow entrance to hide it when they leave.

Many people keep Mongolian gerbils as pets. These small gerbils are agile and fun to watch. They make good pets because they are active during the day.

The common brushtailed gerbil has large eyes and extremely long hind legs in comparison with its body size. So, it can see well and hop very quickly.

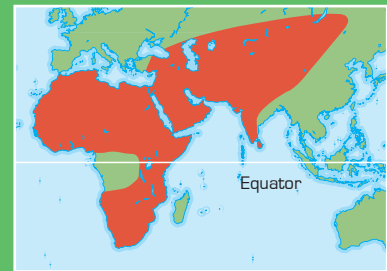
Fact File

GERBILS

Family: Muridae; subfamily Gerbillinae (95 species)

Order: Rodentia

Where do they live? Africa, the Middle East, and parts of Asia



Habitat: Deserts, savannas, and steppes; also on farmland

Size: Head-body length 2.5–8 inches (6–20 cm); weight 0.3–6.7 ounces (8–190 g)



Coat: Usually short golden, light brown, or grayish fur, paler on the belly

Diet: Mainly seeds, roots, and other plant material; some species eat insects, snails, and other small animals

Breeding: 1–12 offspring born after a gestation of 3–4 weeks; need constant care for first 2–3 weeks; weaned at around 4 weeks

Life span: 1–2 years

Status: Around one-quarter of species are threatened; 14 species are critically endangered



GIANT PANDA

One of the world's most easily recognized mammals, this gentle bear is a symbol of conservation worldwide. Wild pandas live in such remote areas that many details of their daily life are only just beginning to be understood.





Most people will never see a giant panda in the wild, but these big black-and-white bears are still among the best loved of all mammals. They are the gentlest of bears. They are vegetarian, except for the occasional insect or other small animal that gets eaten with their favorite food, bamboo. It takes a lot of bamboo to feed a giant panda. A fully grown adult has to eat around 90 to 135 pounds of bamboo every day. That takes a long time—around ten to fourteen hours a day because every mouthful has to be well chewed before it is swallowed.

Giant pandas are extremely rare. They live in dense forests and do not like to be disturbed. Many of these forests have been cut down for timber or to make space for farms or human settlements. That loss of bamboo forest leaves giant pandas stranded in ever smaller patches of habitat. In addition, poachers hunt pandas for their fur coats. Some people are willing to pay a lot of money for the skin of such a rare animal even though it might make the pandas extinct.

Breeding Pandas in Captivity

Worldwide, zoos are working together to build up the panda population. But breeding pandas in captivity is difficult, and the birth of new cubs is always a big event. Pandas seem to breed better in the wild. A cub develops fast and spends eighteen months learning survival skills from its mother before leaving to live alone.

Sitting among the bamboo, this panda spends hours every day eating. These bears are endangered, and China has thirty-three preserves to help save them.

Fact File

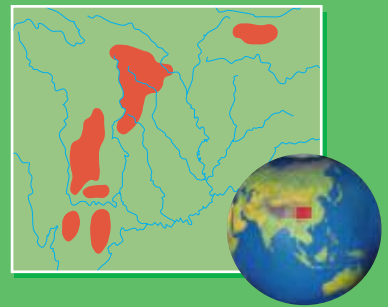
GIANT PANDA

Ailuropoda melanoleuca

Family: Ursidae

Order: Carnivora

Where do they live? Central and western China



Habitat: Bamboo forests

Size: Head-body length 4–5 feet (120–150 cm); weight 220–330 pounds (100–150 kg)



Coat: Very thick fur; mostly white, with black legs and shoulders; black ear and eye patches

Diet: Bamboo and other grass, bulbs, and occasionally small animals

Breeding: 1–2 cubs born after 125–150 days' gestation; weaned at 8 months; mature at 5–6 years

Life span: 20 years in the wild, and 30 or more years in a zoo

Status: Endangered



GIBBONS

Gibbons are well known for the spectacular way in which they swing through the trees at full speed. These apes also sing complicated and tuneful calls that echo through their rain forest habitats.





Gibbons are apes, like orangutans, gorillas, chimpanzees, and humans. Gibbons are large, intelligent primates with complex social lives and no tail. Gibbons are forest animals—they spend almost their entire lives in the trees. They can move easily on two legs but can also get around by swinging from hand to hand below branches. Scientists call this way of moving brachiation, from the Latin word meaning “arm.” Gibbons have long, strong arms and fingers. Short tendons in the arms ensure that when the gibbon’s arm is outstretched, the fingers bend automatically to form a hook. So, a gibbon does not have to use muscle power to hang from a branch—it can dangle for hours without getting tired.

There are fourteen species of gibbons. Most species are about the same size, but the siamang grows almost twice as large as any other gibbon. Most species of gibbons live in different parts of Southeast Asia, and no one species overlaps with another. So, different species do not compete with each other for food.

Filling Up on Fruit

Gibbons eat mainly fruit, which has to be ripe before they can digest it. Gibbons live only in the tropics, where ripe fruit is available all year round. Each gibbon knows its patch of forest very well and which trees bear fruit at different times. Even so, it can take a long time for a gibbon to find a good meal. Gibbons

A common gibbon cradles her small baby. Also called lar or white-handed gibbons, they live in Thailand, the Malay Peninsula, and northern Sumatra.

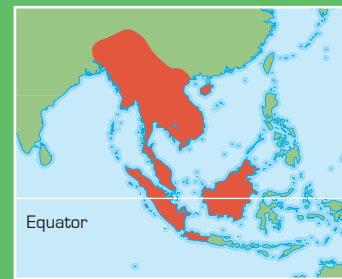
Fact File

GIBBONS

Family: Hylobatidae [14 species]

Order: Primates

Where do they live? Southeast Asia, from eastern India to China and Borneo



Habitat: Forests

Size: Head-body length 18–35 inches (45–90 cm); weight 12–23 pounds (5.5–10.5 kg)



Coat: Medium to long fur, usually with distinctive patterns or ruff around face; color varies from white to black though various shades of gray, blonde, and brown

Diet: Fruit, leaves, and occasionally insects

Breeding: Single offspring born after 7–8 months’ gestation

Life span: 25–30 years in the wild, and up to 40 years in a zoo

Status: Most species are declining in number; more than half are threatened with extinction



GIBBONS

spend around three or four hours each day feeding and almost as long traveling through the trees in search of a tree bearing ripe fruit.

Several different types of trees depend on gibbons to carry their seeds far and wide. The gibbons eat the fruit, and the seeds pass through their gut and out of the other end with the droppings. Many seedlings only grow from seeds that have passed through a gibbon's gut. The seed covering is impenetrable to water until the digestive acids of the

gut break it down. Some gibbons, especially the siamang, also eat leaves, particularly fresh new ones.

Family Groups

Gibbons live in small family groups. Each group is started by a male and a female, who pair up as young adults and usually stay together for life. They rear just one offspring at a time, and it is usually at least two years before the next baby is born. Young gibbons stay with the family for six to eight years. After this time,



MIXED COLORS

Most gibbon species look distinctive, with coat colors or markings that set them apart from others. In some species, even the males and females look quite different. For example, the black crested gibbon is named after the female, which is gold (right) and usually has a black crest. Male black crested gibbons are black with pale cheeks and are sometimes also known as white-cheeked gibbons.



often sing duets that echo for miles through the forest. Sometimes their offspring join in, too.


These songs let other gibbons in the area know that the territory is already occupied by strong, healthy gibbons and to stay away. Young adult males also sing to attract a mate. Because singing is hard work, a female can tell from a male's song whether he is strong and healthy.

Gibbons are threatened by habitat loss. Huge areas of rain forest in Southeast Asia have already been cut down for timber or cleared for farmland. All gibbon species are now much less common than they were twenty-five years ago; experts think that five species might even be extinct in another twenty years. The most endangered species are the island-dwelling Hainan gibbon and the silvery Javan gibbon.




they are fully grown and have learned everything they need to know to survive away from their parents. These gibbons are ready to move away and find a territory and a mate of their own.

Rain Forest Songs and Habitat Loss

Calls and songs are extremely important to gibbons. Both males and female gibbons sing. Their songs include all sorts of long and short calls, many of which sound more like notes from a wind instrument than animal sounds. Pairs of gibbons

 *A pair of silvery Javan gibbons scream together at their neighbors during a fierce dispute over territory.*

DID YOU KNOW?

-  The song of a gibbon can be heard up to 2 miles away!
-  Gibbons hardly ever fall while swinging through the trees. Even if a branch breaks, they can usually twist in midair to grab another branch!
-  A gibbon can leap up to 30 feet from tree to tree!

GIRAFFE AND OKAPI

Giraffes are unmistakable animals—they are world-famous symbols of the African plains. However, their cousin, the okapi, is so secretive and shy that it has only been known to science for little more than a century.





Giraffes are the tallest living animals, and by a long way. The next tallest is the African elephant, which is around 6 feet shorter. A giraffe's legs account for around half of its height; its neck—the longest of any mammal—accounts for the rest. A giraffe's body is short and not particularly large—it is around the same size as that of a large cow.

Browsing Giraffe Giants

Giraffes are browsers; they feed on the leaves and shoots of the trees that are scattered about the savanna grasslands where they live. There are plenty of other browsers on the savanna, including elephants and many different antelope. There is always stiff competition for food. The giraffe's amazingly long legs and neck allow it to feed from branches far above the heads of all the other browsers. That is a big advantage, especially in the dry season when there is not much fresh growth.

Giraffes have large ears and eyes that help them hear and see well. They also have small horns on the top of their head and a long neck.

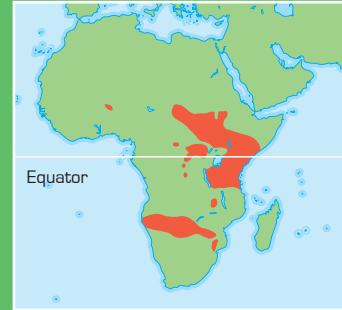
Fact File

Family: Giraffidae (2 species)

Order: Artiodactyla

Where do they live?

Giraffe—Africa south of the Sahara desert;
okapi—central Africa



Habitat: Giraffe—wooded grasslands; okapi—dense tropical forests

Size: Giraffe—head-body length 12–15 feet (3.8–4.7 m); height 13–17 feet (3.9–5.3 m); weight 1,200–4,250 pounds (550–1,930 kg); okapi—head-body length 6–7 feet (190–200 cm); weight 465–550 pounds (210–250 kg)



Coat: Giraffe—short and neat, with distinctive pattern of dark brown to russet patches on cream, fawn, or gold background; okapi—short, glossy, mainly very rich dark brown coat, with bold white markings on legs and rump

Diet: Giraffe—leaves and shoots of savanna trees and shrubs; okapi—leaves

Breeding: Giraffe—single calf born after around 15 months' gestation; okapi—single calf born after 14–15 months' gestation





Life span: Giraffe—25 years in the wild, and 28 years in zoos; okapi—15 years or more


Status: Giraffe—lower risk, some local subspecies are threatened; okapi—near threatened

GIRAFFE AND OKAPI

However, being so tall also has disadvantages. A giraffe's long legs make it difficult for the giraffe to reach the ground with its mouth. So, it cannot eat low-growing plants and struggles to drink. To reach the water, a giraffe has to spread its front legs extremely wide. From this awkward position, it can be difficult for a giraffe to react quickly to danger. In addition, giraffes struggle to move over uneven or boggy ground.

DID YOU KNOW?

-  The okapi was discovered by a British explorer only in 1901. It was the largest new mammal to be discovered in the twentieth century!
-  A giraffe's tongue can be up to 18 inches long—and it is blue!
-  Baby giraffes have horns that fold back so they do not get stuck when the animal is born!
-  The structure of a giraffe's neck is similar to that of a crane on a building site!

 *A giraffe's long neck enables it to reach the leaves and shoots that grow high in the trees. They do not have to compete for this food with shorter browsers.*





WRESTLING MATCHES


From a young age, male giraffes spend a lot of time neck wrestling each other. To begin with this activity is just a game, but it also has a serious side. Neck wrestling helps strengthen the muscles of the neck and shoulders and also allows the males to size each other up. By the time a male reaches adulthood, he will know most of the other males in his area and know which one is the strongest. The largest and strongest males get to mate with more females, and the smaller males sensibly stay out of their way and wait until they grow larger.



Being so large means that giraffes must eat a lot and make the most of every mouthful of food. Leaves are difficult to digest, but giraffe digestion is thorough. Giraffes are ruminants. Between meals, giraffes chew the cud like cows: They cough food back up into their mouth and rechew it. That helps mash up the leaves and mix them with bacteria (single-celled microorganisms) from the giraffe's large stomach. These bacteria break down the tough molecules that make leaves difficult to digest. Unlike cows, giraffes can chew the cud while on the move in search of the next good feeding spot.

Fighting for Females

Giraffes usually live in loose groups of mostly females and young giraffes; different members come and go and there is no fixed leader. Adult males wander alone but are never far away. There is no fixed breeding season, so the males are always on the lookout for females that are ready to breed. Females in season attract a lot of attention, and males compete for the right to mate by neck wrestling each other. These contests usually show who is the strongest, but if the males are closely matched, they may end up in a real fight. Fighting males kick with powerful hind legs and try to

 *These two young giraffe bulls (males) are neck wrestling. They slowly intertwine their necks and push from one side to the other to find out which bull is strongest.*

GIRAFFE AND OKAPI

club each other with their hard, horny head. Giraffes also use their hooves to defend themselves against predators. But even adult giraffes are vulnerable to predators that hunt in teams, such as lions and hyenas. Giraffes use their height and good eyesight and hearing to check their surroundings for danger. Giraffes are safer in groups; lone giraffes are almost twice as likely to be attacked as giraffes in a group.

Giraffe Relatives

Giraffes have an unlikely looking relative, called the okapi. An okapi is

DID YOU KNOW?

- Despite its amazingly long neck, a giraffe has only seven neck bones—the same number as a human!
- People once thought the giraffe looked like a cross between a camel and a leopard—hence its scientific name *camelopardalis*!
- A male giraffe's skull gets thicker as it gets older. Its head gets heavier by around 2.2 pounds every year!

roughly the size and shape of a horse and lives in the thick forests of central Africa in places where no giraffe could ever go. These two extremely

▼ *This okapi is searching for food in a thick rain forest. Okapis have zebra-like stripes, especially on their hind legs.*





SHRINKING RANGES

Giraffes once lived throughout most of southern Africa. Now their range is patchy, and they have disappeared from places where hunting, farming, and other human activities have developed. Some local varieties of western African giraffes are in danger of becoming extinct, and so the whole species is listed as conservation dependent. However, giraffes are one of the animals people on safari most like to see, and so it is in the interests of African countries to protect giraffes.



different animals are a great example of how evolution can lead closely related animals to develop quite different features to cope with a variety of challenges.

Okapis are difficult to study in the wild, and much of what is known about them comes from studies in zoos. Even 100 years after they were discovered, there is still a lot people do not know about the natural behavior of okapis.

Okapis live alone for most of the time and are probably territorial. They feed like giraffes, on leaves stripped from branches by the teeth or plucked by the long tongue. Female okapis are in season for up to a month, which is much longer than for most other hoofed animals. That is probably because in the dense forest it can take males a long time to find females. Okapis are protected by law, but people still hunt them illegally for meat to eat or to sell.

▲ A giraffe mother stands tall over her calf. At birth, a giraffe weighs around 220 pounds and grows approximately 3 inches a month.

GOLDEN MOLES

In many ways, golden moles look and behave like ordinary moles but they have no visible eyes or ears. Even so, these burrowers can find their way about and track down prey in a complex system of underground tunnels.





Scientists once thought golden moles were close relatives of similar small insect eaters, such as true moles and hedgehogs. Now scientists have looked at the golden mole's genes and found that these animals are more closely related to armadillos and elephants. A golden mole's closest cousin is the tenrec—a small, shrewlike or hedgehog-like African animal.

It is easy to see how golden moles got their name. They look very much like true moles and they live underground, burrowing through sandy soils in search of earthworms and insect grubs to eat. Their fur is short and velvety, with a metallic gold or bronze gleam.

Shoving Aside Soil

Golden moles are powerful diggers. Their front legs are short but strong, and the wedge-shaped head is used to shove soil aside. The toes of the front feet have large claws, which are ideal for loosening hard-packed earth. Golden moles dig using a running motion, unlike true moles, which dig using a swimming action.

Golden moles live alone and spend almost their whole life underground. They dig feeding tunnels near the surface, where most prey can be found. Golden moles do not hunt—they simply patrol their tunnels and grab anything that comes their way. They sense the movement of prey as vibrations in the ground. Golden moles also dig deeper tunnels, in which they rest and rear their offspring.

The smooth, outer hairs of the golden mole's coat are waterproof and so shiny that dirt does not stick. Clean fur helps keep the golden mole warm and dry.

Fact File

GOLDEN MOLES

Family: Chrysochloridae (21 species)

Order: Afrosoricida

Where do they live? Southern Africa



Habitat: Sandy soils

Size: Head-body length 3–9 inches (7–23 cm); weight 0.5–5 ounces (15–142 g)



Coat: Short and neat; color varies with species; outer hairs have golden metallic gleam

Diet: Invertebrate grubs and small reptiles

Breeding: Litters of 1–2 offspring, born in rainy season

Life span: Not known

Status: Around half of all species are threatened with extinction



GORILLAS

These primate powerhouses are the gentle giants of the great ape family, to which humans also belong. Gorillas are smart, sensitive, sociable experts in tropical forest survival, but there are few places where they are now able to live in peace.





People and gorillas have a lot in common. People are more closely related to gorillas than any other animal, except chimpanzees. Gorillas are massive, bulky animals—the largest of all primates. Male gorillas are larger and more muscular than females.

There are two species of gorillas, the eastern and the western. They look similar, but the eastern gorilla has a darker coat. Western gorillas live in tropical forests of the Congo basin in countries such as Congo and Equatorial Guinea as well as Nigeria and Cameroon. Eastern gorillas live in swampy and mountainous forests of Rwanda and Uganda in Africa.

Gorillas need a lot of food. They love fruit and eat as much as they can find. They fill up on leaves and shoots and other plant material. All of this food takes a lot of grinding, so gorillas have massive cheek teeth and huge jaw muscles that help them chew. These muscles give the face a distinctive deep and wide shape.

Ground-living Gorillas

Gorillas walk on all fours, on the soles of the feet and the knuckles of the hands. Their arms are at least as long and as strong as their legs. Gorillas do not travel long distances—rarely more than a few hundred yards a day. Usually a troop (group) can find everything it needs to survive within just a few square miles, and gorillas are not territorial. Gorillas spend most of their days on the ground, but they can climb well, too.

An old silverback lowland gorilla casts a quizzical eye over his family group. A silverback is a fully grown male in charge of a group of females and young.

Fact File

GORILLAS

Gorilla gorilla and *Gorilla beringei*

Family: Hominidae

Order: Primates

Where do they live? Africa, close to the equator



Habitat: Tropical forests

Size: Height 50–71 inches (130–180 cm); weight 200–400 pounds (90–180 kg)



Coat: Dark brownish gray to black, short on back, shaggy elsewhere; large males have patch of gray fur on the back

Diet: Leaves, fruit, shoots, bark, and a few invertebrates, such as termites and caterpillars

Breeding: Single offspring (twins rare), born after 250–270 days' gestation; weaned at 2–3 years; mature at 8–10 years

Life span: 35 years in the wild, and 50 years in zoos

Status: Both species endangered; some subspecies are critically endangered



GORILLAS

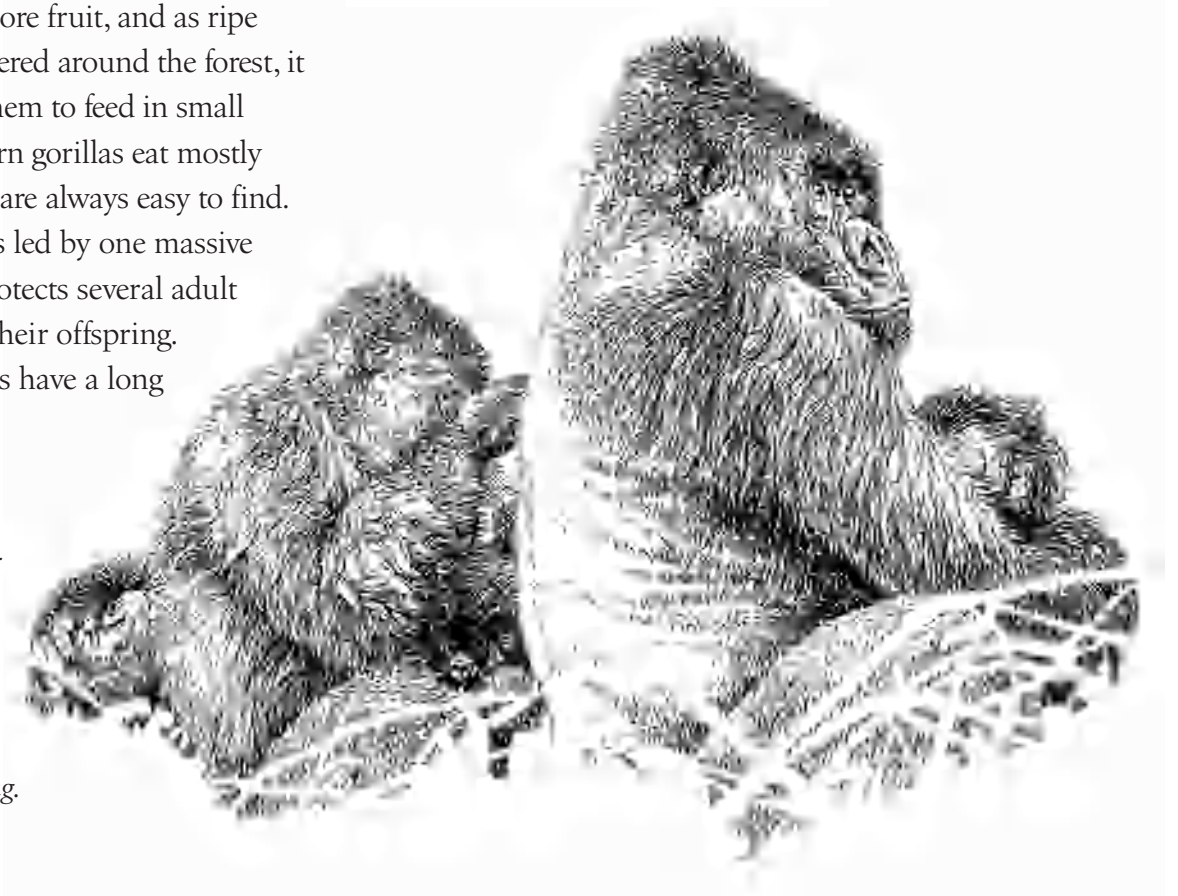
Small gorillas are nimble and can swing from their arms, as gibbons do. Gorillas climb trees to pick fruit and to rest. When sleeping in trees, gorillas build a nest from folded branches. Sleeping in a nest is warmer and safer than lying on the cold, damp, and steep ground.

Groups of Gorillas

Gorilla groups are extremely stable. Eastern gorilla groups may contain forty animals, but ten is more normal. Groups of western gorillas contain five to ten animals. Western gorillas eat more fruit, and as ripe trees are scattered around the forest, it is easier for them to feed in small groups. Eastern gorillas eat mostly leaves, which are always easy to find. Each group is led by one massive male, who protects several adult females and their offspring. Young gorillas have a long

childhood. Many gorillas are not weaned until they are three years old and stay with their mother for ten years or more. By this time, they have one or even two younger brothers or sisters. Each gorilla knows all the other group members, and the adult females are often related. When they reach adulthood, most young gorillas move away from their mother's group. Young females join up with another group to breed. Females do not wander alone, so they wait until their group comes close to another and simply swap groups. Young

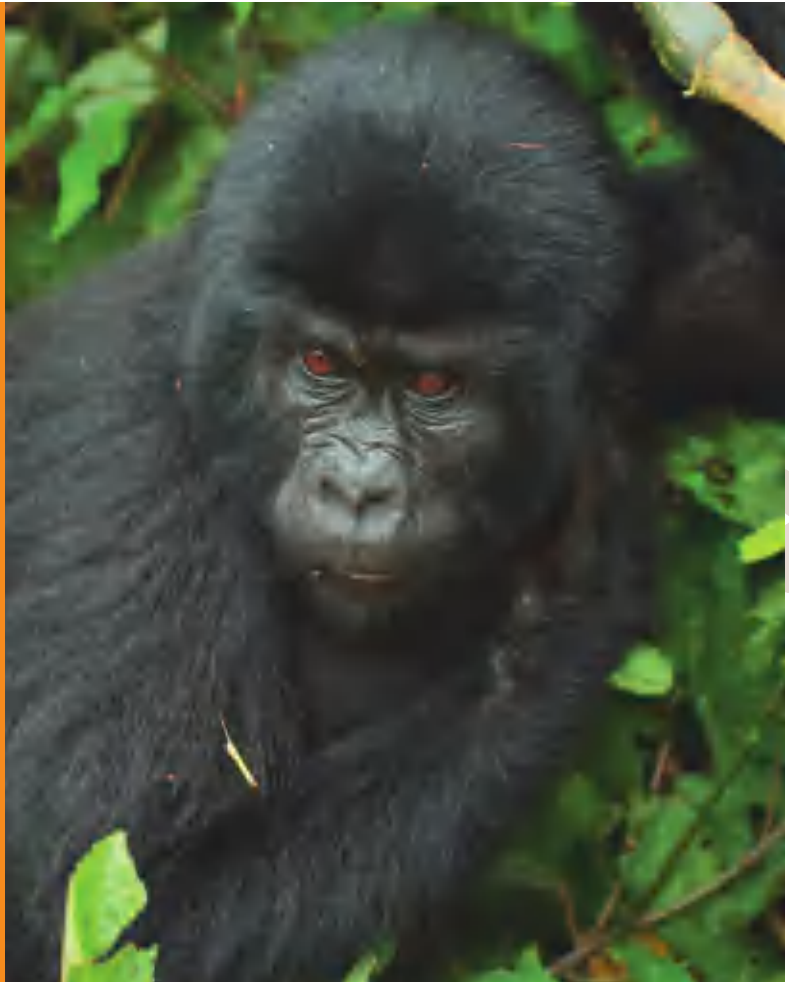
▶ *A female gorilla and her infants rest in the middle of the day after spending the morning feeding.*








WHAT FUTURE FOR GORILLAS?

Gorillas are highly endangered. They have lost huge areas of habitat due to human activities such as hunting, logging, farming, and building. The countries where they live are poor and many have suffered long wars. When people themselves are fighting to survive, it is difficult for them to show much concern for gorillas. However, in countries where there is peace, there is also hope for the gorillas' future. Tourists come from all over the world to see gorillas, and the money they spend can make a big difference to the whole country.



males usually join groups of other males and spend a few years growing big and strong. One day they may lead their own group. A powerful male of fifteen to twenty years can move in when an old male dies or becomes too weak to look after his females. If the females like the new male, they stay with him.

DID YOU KNOW?

-  Gorillas share 98 percent of their DNA with chimpanzees and humans. Gorillas, chimps, and humans are all equal cousins!
-  Gorillas have the language skills of an average two-year-old child!
-  Gorillas weigh as much as two or three adult humans!

GRAY WHALE

Gray whales are long-distance travelers, feeding in the far north and breeding in the tropics. Every year gray whales migrate more than 12,000 miles. Because they nearly always travel in sight of land, these whales are easy to watch.





Gray whales are a fairly common sight along the west coast of North America. In spring and fall, thousands of people travel there every year to see gray whales pass by on their long migrations. However, fifty years ago, these huge mammals were almost extinct. They had been hunted for hundreds of years for meat and oil. The gray whale population had fallen to just a few thousand individuals. Now they are protected, and the only people allowed to hunt gray whales are Inuits and Native Americans, who use traditional methods and kill only a few whales each year. There are now around 25,000 gray whales living in the eastern Pacific Ocean.

Gray whales are a distinctive shape. Instead of a dorsal (back) fin, gray whales have a row of bumps running along the lower part of the back. In adults, the skin is always blotchy and covered with big clumps of barnacles.

Winter Feeding, Summer Breeding

Female gray whales are pregnant for thirteen months and rear only one calf every other year. Female gray whales mate one winter, give birth during the next winter, and mate again during the third winter. Newborn gray whales are much skinnier than adults. It takes the calf a few months to build up a thick enough layer of blubber, or fat, to cope with living in cold water. So, the mother must travel somewhere warm to give birth. That is why gray whales gather every winter in the warm, shallow waters of Baja California, off the coast of Mexico.

A big, barnacled gray whale breaching. A breach takes place when a whale leaps halfway or more out of the water and then falls back onto its side.

Fact File

GRAY WHALE

Eschrichtius robustus

Family: Eschrichtiidae

Order: Cetacea

Where do they live? Coastal areas of Pacific Ocean, from Baja California and Japan, to arctic waters



Habitat: Coastal waters less than 330 feet (100 m) deep

Size: Head-body length 39–50 feet (12–15 m); weight 18–38 tons (16–34 metric tons)



Skin: Mottled gray, with patches of barnacles and whale lice

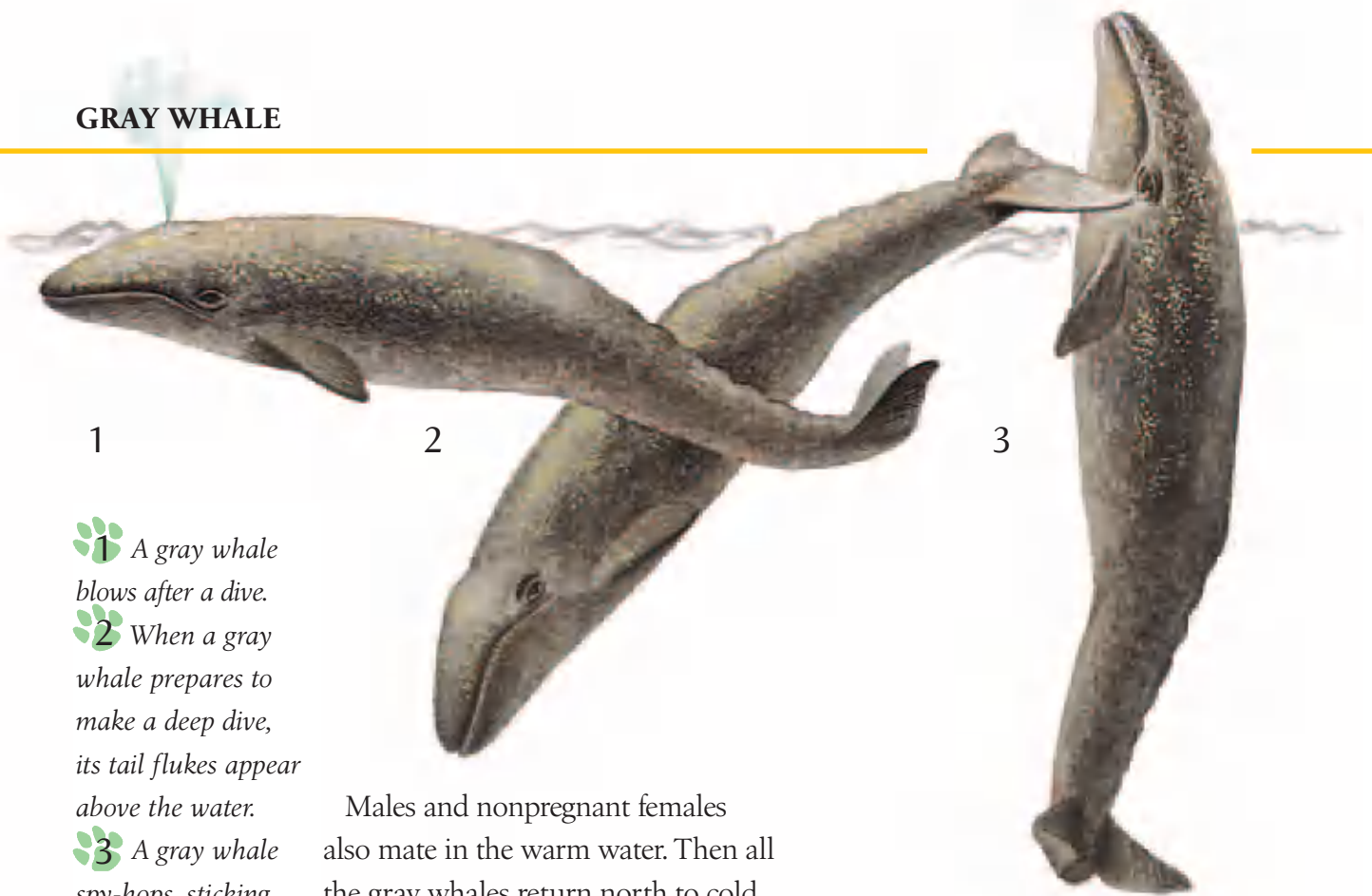
Diet: Plankton and bottom-living invertebrates, mostly small crustaceans

Breeding: Single calf born after 13 months' gestation; weaned at 7 months; able to breed at around 8 years

Life span: Up to 77 years

Status: No longer hunted intensively, but still conservation dependent; the population around Japan is critically endangered

GRAY WHALE



1

1 A gray whale blows after a dive.

2

2 When a gray whale prepares to make a deep dive, its tail flukes appear above the water.

3

3 A gray whale spy-hops, sticking its head above the water to check its surroundings.

4 A gray whale mother swims with her calf.

Males and nonpregnant females also mate in the warm water. Then all the gray whales return north to cold waters in the spring.

Gray whale calves grow amazingly fast—the mother's milk is extremely fattening and a calf can put on up to 70 pounds a day. By the time the calves reach arctic waters, at around six or seven months old, they are fat

enough to survive the cold and ready to begin eating solid food.

Gray whales eat mainly small, flealike crustaceans called amphipods. In midsummer, billions of these creatures are present; the long hours of daylight encourage the algae and other plankton (microscopic animals and plantlike life-forms) on which amphipods feed to grow and reproduce superfast.

Sieve Eaters

Amphipods live in the seabed, and gray whales have an unusual way of feeding. The whales swim to the



4



▼ *Gray whales often swim within half a mile of shore, which makes them easy to watch closely.*




seafloor and plow along the bottom with their mouth open. They take in lots of mud and sand, along with the amphipods and other small buried animals. Instead of teeth, gray whales have a mouth full of bristly combs, called baleen. Baleen acts as a sieve to collect the food, while the mud and sand pass through the baleen with the water and leave the mouth. From



WHALE WATCHING

Gray whales are curious animals. They often swim toward boats and seem interested in people. Some gray whales come right alongside small boats and even allow themselves to be stroked. Being so trusting and inquisitive once made gray whales easy targets for hunters. Now gray whales are protected, and the boats that go out in search of them are full of whale watchers instead of hunters.

DID YOU KNOW?

-  Most gray whales turn on their right side to feed on the seabed!
-  A gray whale that lives to be seventy years old will have swum approximately 750,000 miles on migrations!
-  A large gray whale may have up to 350 pounds of barnacles attached to its body!

above, feeding gray whales are easy to spot because they create clouds of stirred-up mud from the ocean floor and leave long furrows in the seabed.

Having fed well all summer, adult whales return to Baja California in the fall. Males and females whose calves have just weaned go there to mate. Once the females are pregnant, the gray whales quickly travel north to begin feeding again.

Hunted by Killer Whales

Apart from humans, the only other animals that hunt gray whales are killer whales, or orcas. Orcas hunt in groups and target young calves. The gray whale mother can do very little to protect her calf once orcas begin an attack. Gray whale calves cannot swim fast enough to get away, but sometimes they can hide from orcas in dense patches of seaweed.

HAMSTERS

Most people in the western world know these small rodents with their bulging cheek pouches as pets. However, in much of Asia and eastern Europe, hamsters are wild animals. Some species are farm pests, while others are now very rare.





The most popular species of pet hamster is the golden hamster, but this species is extremely rare in the wild and lives only in a tiny area of Syria in the Middle East. Most pet golden hamsters are descended from just one female, one of four young hamsters taken from the wild in 1930. There are twenty-six species of wild hamsters. Not all hamsters are small; some species are almost the size of a rabbit. Hamsters live mainly in dry habitats, and some even live in deserts. They are active mostly at night, when they can avoid overheating and stay out of the way of predators.

Hamster Hoarders

Hamsters eat mainly grains, seeds, shoots, and roots. They are great hoarders. They have large cheek pouches, into which they can stuff dozens of seeds to carry back their burrows and store in underground larders. Hamsters hibernate in winter but wake up from time to time to feed from their larder. Common hamsters also sometimes add meat to their diet, by hunting insects, small lizards, and mice.

Despite their reputation as cute pets, wild hamsters can be fierce; they live alone and do not like company. Males fight when they meet, and the large Korean hamster even attacks dogs or people in self-defense.

Hamsters breed fast. Females breed at less than two months old. Litters are large; up to twenty-two offspring in the Korean gray hamster, but usually around ten.

*A white Russian hamster bites into a peanut.
Hamsters are rodents. All rodents have two pairs
of sharp incisor teeth, which grow throughout life.*

Fact File

HAMSTERS

Family: Muridae; subfamilies Cricetinae and Calomyscinae (26 species)

Order: Rodentia

Where do they live? Europe and temperate Asia



Habitat: Dry landscapes, including grasslands, deserts, mountain slopes, and farmland

Size: Head-body length 2–11 inches (5–28 cm); weight 1.8–32 ounces (50–900 g)



Coat: Soft and thick; usually gold, brown, or gray; paler on the belly, with variable markings

Diet: Mainly seeds, shoots, and roots

Breeding: Litters of several offspring (up to 22) born after 15–37 days' gestation

Life span: 2–3 years

Status: 2 species are endangered; 1 species is vulnerable



HEDGEHOGS AND MOONRATS

Spiny hedgehogs are familiar to most people living in Europe, Asia, and Africa. Their cousins, the moonrats and gymnures of South Asia, are much more secretive and less well known.





Hedgehogs are popular animals, especially with gardeners, because they eat a lot of small pests such as slugs and beetle grubs, which damage plants. Hedgehogs are also easy to watch. With their coat of prickly spines for protection, they do not run away when frightened—they simply roll into a ball and rely on their spines for protection. In time, hedgehogs can become quite tame. Many people put out food for hedgehogs, which come to eat in plain view.

The best-known hedgehog is the common Eurasian hedgehog. Fifteen other hedgehog species live in different parts of Asia and Africa, many in deserts. Moonrats and gymnures look a little like nonspiny hedgehogs. They are nocturnal (active at night) and eat invertebrates (animals without backbones), but the details of their lives are not well known.

Hunters and Hibernators

Hedgehogs have small, bright eyes and a long, pointed snout. They hunt mainly by smell. They are active at night and travel long distances in search of food. Hedgehogs can climb and swim well, and they also have excellent hearing. In winter, when food is scarce and temperatures are low, the common hedgehog hibernates in a nest made of leaves. Hedgehogs from warm climates do not need to hibernate.

Hedgehogs have only two serious enemies: badgers, which can easily kill them, and people driving cars.

Although a hedgehog's spines protect it against most predators, they are no defense against lawnmowers or cars, which kill millions of hedgehogs every year.

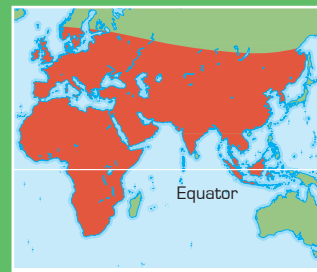
Fact File

HEDGEHOGS AND MOONRATS

Family: Erinaceidae [16 species of hedgehogs; 8 species of moonrats]

Order: Erinaceidae

Where do they live? Europe, Africa, and most of Asia, including Indonesia; hedgehogs imported as pets into North America



Habitat: Woodlands, grasslands, forests, mangroves, farmland, and urban parks and backyards

Size: Head-body length 4–18 inches (10–45 cm); weight 0.5–70 ounces (15–2,000 g)



Coat: Moonrats—coarse hair; hedgehogs—modified hairs form sharp spines

Diet: Worms, snails, slugs, beetles and other insects, birds' eggs, and carrion (meat of dead animals)

Breeding: Litters of offspring born after 30–48 days' gestation

Life span: Up to 7 years

Status: 7 species are at risk

HIPPOPOTAMUSES

Common hippos are among the largest hoofed animals. They spend half of their life wallowing in shallow water and mud and eat only grass. But despite this relaxed, vegetarian lifestyle, hippos have a reputation for being bad tempered and extremely dangerous.





There are two species (types) of hippopotamuses—the common hippo and the pygmy hippo. Common hippopotamuses lead a double life. By day they gather in rivers and pools, where they wallow and doze and often squabble among themselves. Each evening they come out onto dry land to feed. Common hippos eat grass and travel several miles to find good grazing. At dawn they walk back to the water. There are many advantages to living in water that make all the coming and going worthwhile. Hippos have no fur and their skin is thin. The skin dries out fast, and if a hippo spends too much time out of water in the sun, its skin burns and then dries out and cracks.

Wallowing in Water

Spending the day in water also prevents hippos from overheating, but the water is warm enough that they never become chilled. As the water supports most of the hippo's body weight, it does not have to

While it wallows in the water, this common hippopotamus shows off two razor-sharp tusks in its lower jaw as it opens its mouth wide.

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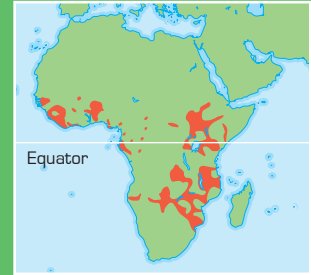
HIPPOPOTAMUSES

Family: Hippopotamidae (2 species)

Order: Artiodactyla

Where do they live?

Common hippo—Africa, south of the Sahara desert; pygmy hippo—West Africa



Habitat: Common hippopotamus—pools and slow-moving rivers, close to good grazing; pygmy hippopotamus—dense tropical forests

Size: Common hippo—head-body length 10 feet 9 inches–11 feet 4 inches (3.4–3.45 m), weight 1.6–3.6 tons (1.4–3.2 metric tons); pygmy hippo—head-body length 4 feet 11 inches–5 feet 8 inches (1.5–1.75 m), weight 400–600 pounds (180–275 kg)



Skin: Common hippo—bluish gray, mottled with pink, almost completely hairless; pygmy hippo—oily, olive-green to gray, and hairless

Diet: Common hippo—grass; pygmy hippo—fruit, shoots, ferns, grass, and herbs

Breeding: Common hippo—single calf born after 240 days' gestation; pygmy hippo—single calf born after 190–210 days' gestation; both weaned at 12 months, mature at 8 years

Life span: Common hippo—45 years in the wild, and 49 years in zoos; pygmy hippo—35 years in the wild, and 42 years in zoos

Status: Common hippo—not threatened, but numbers declining, and 1 subspecies (local type) vulnerable; pygmy hippo—vulnerable, Niger Delta subspecies is critically endangered

HIPPOPOTAMUSES

spend much energy during the day. That is just as well, because a hippo's grassy diet would not provide enough energy to fuel its large body if it had to keep warm or move about on land.

The hippo's body is large and barrel shaped and the legs are short. The hippo has webbed toes that help it swim. The head is large, too, with the eyes, ears, and nostrils arranged on the top of the head and snout. So, a hippo can see, hear, and breathe while wallowing low in the water.

A hippo's mouth is huge. A hippo can open its mouth extremely wide to form an enormous yawning gape, showing two long, razor-sharp tusks in the lower jaw. These teeth are not used for feeding—they are weapons. Hippos are aggressive, and fights are common, especially between males.

Territorial Behavior

Each large male hippo marks out a section of riverbank as a territory by scattering dung all over it. Males mate with the females in their territory. Mating happens in the water and is over quickly. At other times, males and females ignore each other. Large males allow other males to use the same section of river, providing they do not mate with the females living there.

Hippopotamus calves are born in the water and stay close to their mother for safety. When the river is crowded with hippopotamuses, the calves can easily be crushed or drowned. Calves suckle underwater and remain under the mother's watchful eye long after they are weaned and until they are ready to breed, at around eight years old.

▼ *A group of common hippos wallows by the edge of a river. When it gets too hot, they enter the water to cool off.*



SWEATING BLOOD?

People used to think that hippos sweated blood. However, they produce a pink, oily substance from the skin, which acts as a moisturizer and sunscreen. That helps keep their skin in good condition. It may also stop germs from infecting the animal. Hippos often get cuts and scrapes from rocks in the water or from fights. However, although hippos live in filthy water, their wounds hardly ever seem to get infected.



▲ *This pygmy hippopotamus has found something to eat. These hippos eat fruit, shoots, ferns, grass, and herbs, while the common hippopotamus eats only grass.*

Pygmy Hippopotamuses

The life of the pygmy hippo is very different. These shy forest animals usually live alone, except for mothers with a calf. They mate in the water, as do common hippos, and wallow in mud or water to cool down. Pygmy hippos spend much more time on dry land, however. The sun is less of a problem because their skin is oily and shiny and does not dry out as fast as that of common hippos. Pygmy hippos also live under the shade of trees and sometimes even use large burrows dug by other animals.

Pygmy hippos are difficult to study. Many scientists fear they are

becoming rare. Pygmy hippos are sometimes hunted for meat, but the main problem is loss of habitat. Large areas of forests in West Africa continue to be cut down for timber and to make space for farming.

DID YOU KNOW?



The word *hippopotamus* means “river horse” in Greek.



Hippos are bad tempered, and African people consider them among the most dangerous of all wild animals!



Compared with hippos, humans have tough skin. Human skin is much thicker than that of a hippopotamus and loses water at about a quarter of the speed.

HONEY POSSUM

This tiny, mouselike marsupial has no close living relatives—and some people think it should not be called a possum at all. Honey possums are among the very few mammals that eat only pollen and nectar.





Honey possums are marsupials, so females rear their offspring in a pouch, but they also have a grasping tail like a harvest mouse and nimble fingers like a tiny monkey. Honey possums eat only nectar and pollen, just as a hummingbird does. Honey possums collect their food from flowers using a long tongue that has a brushlike tip. They have just a few tiny, peglike teeth and cannot chew other types of food. In winter, if food is difficult to find, honey possums go into a deep sleep to save energy. This sleep is a little like hibernation, but it lasts for only a few days.

Agile Climbers

Honey possums are agile climbers and, as they weigh so little, they can climb onto extremely fine branches to reach the flowers. They have tiny, monkeylike hands and feet, and the tips of their fingers and toes are wide, which allows them to grip well. The long tail can curl around branches. A honey possum can even dangle from its tail because it grips so tightly.

Female honey possums are larger than males and more territorial. They can breed at any time of the year. Their babies are the smallest of any mammal, weighing only a tiny fraction of an ounce. These tiny creatures crawl to the mother's pouch and attach themselves to a teat. Baby honey possums grow fast, increasing their weight to around 0.1 ounce in two months, and then begin exploring the outside world.

A honey possum has found two flowers to feed on. These tiny marsupials are unusual mammals because they eat only flower pollen and nectar.

Fact File

HONEY POSSUM

Tarsipes rostratus

Family: Tarsipedidae

Order: Diprotodontia

Where do they live?: Southwestern Australia



Habitat: Heathlands and open scrubby woodlands

Size: Head-body length 2.6–3.5 inches (6.5–9 cm); weight 0.3–0.6 ounce (7–16 g)



Coat: Grayish brown, tinged with orange on flanks; three dark stripes along back

Diet: Nectar and pollen

Breeding: 2–3 offspring born after around 28 days' gestation; weaned at 10 weeks; mature at 10 months

Life span: Less than 2 years

Status: Lower risk; depends on food supply



HOOFED MAMMALS

Four out of five of Earth's large land mammals have fingernails and toenails that grow into hard, strong hooves. These animals come in a huge variety of shapes and sizes. Most hoofed mammals are fleet-footed vegetarians, and several have become vital to people as farm animals.

Most hoofed mammals have a stout, barrel-shaped body, a longish neck and a long, narrow head. They have thick skin, and their coats range from short and silky in most antelope and horses, to long and shaggy in the yak, woolly in sheep and camels, sparse and bristly in pigs, and nonexistent in hippopotamuses and rhinoceroses. Several groups of hoofed mammals have horns, and in most deer, the males grow a fresh set of antlers every year. The legs of hoofed animals are slim and usually quite long. Their feet have fewer than five toes, and the bones of the foot are longer than in other mammals.

There are two main groups of hoofed mammals: odd-toed and even-toed ungulates. Odd-toed ungulates have an odd number of toes on each foot. They include horses, which

have one toe, and tapirs and rhinoceroses, which have three toes on each foot. Even-toed ungulates form a larger group, including cattle, deer, pigs, hippopotamuses, and camels. Even-toed ungulates have feet with two or four toes.

The structure of a hoofed mammal's foot is ideal for running, but not much use for anything else. Horses, pigs, and deer can never



1. *Black rhinoceros*
2. *Mountain tapir*
3. *African ass*



▲ *The American bison is an enormous hoofed mammal that now lives mostly in parks and refuges.*

use their feet for grasping. Some hoofed mammals use their feet as weapons for kicking or stamping or as tools for digging shallow holes. However, apart from that, the most any of these mammals can manage is an awkward scratch of the belly with a hind foot. Some hoofed mammals can use other body parts for more delicate operations. For example, the black rhinoceros can pluck individual leaves with its upper lip, a giraffe can grip branches and clean around its own eyes using its very long tongue, and horses can flick away flies with their tail.

Plant Eaters All

All hoofed mammals eat plants. Some of these mammals are specialized, such as the common hippopotamus and the white rhinoceros, which eat only grass. Others, such as giraffes and deer, eat a variety of leaves and shoots from many different kinds of plants. A few, including pigs and peccaries, eat anything from fruit and roots, to fungi and the flesh of other animals.

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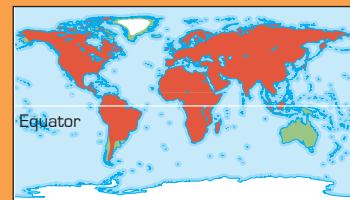
HOOFED MAMMALS

Families: 13 families (212 species)

Orders: Perissodactyla and Artiodactyla

ODD-TOED UNGULATES (Perissodactyla)

Horses, zebras, and asses: 7 species of large, fast-running grazers, with a single toe and hoof on each foot



Tapirs: 4 species of medium-to-large, stout-bodied, slim-legged mammals of tropical forests

Rhinoceroses: 5 species of large, thick-skinned, three-toed herbivores; most have large horns growing from the snout

EVEN-TOED UNGULATES (Artiodactyla)

Pigs: 13 species of medium-to-large omnivorous forest animals with a robust body and slim legs

Peccaries: 3 species of South American, piglike mammals

Hippopotamuses: 2 species of large, barrel-bodied, partly aquatic African mammals

Camels and llamas: 6 species of medium-to-large desert- or mountain-dwelling mammals with long legs, a long neck, and woolly fur

Deer: At least 38 species of medium-to-large, herbivores with cloven (split) hooves; most have long legs; males bear antlers or tusks

Giraffe and okapi: 2 species of homed African browsing mammals, one a tall plains dweller, the other a shy forest mammal




Cattle, antelope, and sheep: At least 123 species of cloven-hoofed, often homed, ruminants; several species are domesticated

HOOFED MAMMALS


However, plants make up most of the diet for nearly all types of hoofed mammals.

Some plants are better food than others, but the best ones are nearly always the hardest to find. Fruit, for example, contains lots of energy and is easy to digest. However, it grows only on certain plants and at certain times of the year. As a result, no hoofed mammals rely completely on fruit. New leaves and shoots and flesh grass are tender enough to digest quite easily, but in some

DID YOU KNOW?

-  The saola is a small ox that lives in the region around the Laos–Vietnam border. It is so secretive that it was only discovered by scientists in 1992.
-  The largest land mammal that ever lived was a 13.3-ton rhinoceros called *Indricotherium*. It is now extinct.
-  Africa is home to the greatest number of different species of hoofed mammals.



 A pair of male hipopotamuses fight over the right to mate with females, using their razor-sharp lower canines.

 A wild boar looks for food. These hoofed mammals live in Europe, northern Africa, Asia, Sumatra, Japan, and Taiwan. They have also been introduced to North America.





🕒 A red deer stag displays its large antlers. Most male deer grow a set of antlers every year and use them to fight for territory and access to females.

parts of the world, these plants grow only in spring and summer. Tough old grass, bark, and older leaves are nearly always easy to find, but they are the hardest of all to digest. Different species of hoofed mammals have evolved to eat a variety of food types. One group, known as

ruminants, have evolved a way to make use of really tough plant matter. They have a slow, complicated type of digestion that allows them to make the most of every mouthful of grass, leaves, or even wood. Ruminant animals include cattle, antelope, deer, giraffes, chevrotains, and musk deer. They all have a many-chambered stomach that contains bacteria. These single-celled microorganisms help break down the tough plant molecules and turn them into simple chemicals that can be digested. Horses and rhinoceroses also use bacteria to help them break down plant matter. In these animals, however, the bacteria live near the end of the gut in an organ called the cecum. Food passes

MAKING FACES

Apart from the nose, most hoofed mammals have a second scent organ in the mouth, called Jacobson's organ. Male hoofed mammals, such as the Asiatic ass (right), often use this organ to "taste" the scent of a female to see if she is ready to breed. The males usually make a strange face when they are doing this, with their lips curled back. Scientists call this behavior the flehmen response.



DOMESTICATING HOOFED MAMMALS

People began to domesticate (breed and tame) animals, such as cattle, sheep, horses, and camels, around 10,000 years ago. Farming these animals is easier than hunting them, and by controlling the way they breed,

farmers have been able to develop new breeds—cows that produce more milk or better meat, sheep with better wool, stronger horses, and so on. The wild ancestors of many domesticated hoofed mammals are all but extinct.



👉 *Free-roaming mustangs of North America are descended from escaped domesticated horses.*

through the gut of rhinoceroses and horses much more quickly. These animals can afford to eat lower-quality food, as long as they get plenty of it.

Danger from Predators

Most hoofed animals have good eyesight and hearing, which they use mainly for sensing danger from predators and picking up signals from other members of their species. The sense of smell is also extremely important to most

hoofed mammals. Those animals that live in dry areas rely on the occasional rainstorm to encourage the growth of fresh leaves and grass. They can pick up the scent of rain from miles away, and they flock toward it. In Africa, rains can bring vast herds of antelope, zebra, and cattle from hundreds of miles around to create an amazing sight on the open plains.




Smell can be vital in warning of predators nearby, and it is one of the most important senses for communication. Most hoofed

mammals, especially even-toed ones, have glands in the face and feet that produce scent. They leave this scent on the ground, on objects such as trees and rocks, or even on each other. The scent tells other animals a great deal about the animal that left it—how old it is, whether it is male or female, its health, and whether it is ready to breed. Some hoofed mammals, in particular horses, also use sound and body language to communicate with others of the same species.

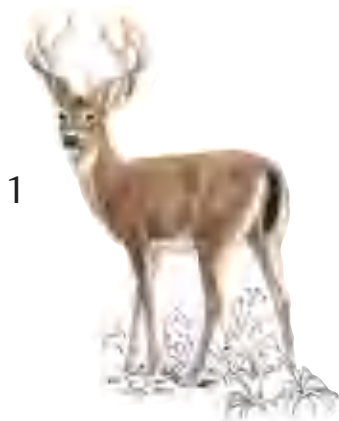
Social Lives

The social lives of hoofed mammals vary. Those that live in the open, including most grazers, live either in large groups for safety, such as zebras, South American guanacos,

DID YOU KNOW?

-  The American pronghorn is the fastest living hoofed mammal—it can reach speeds up to 53 miles per hour!
-  The smallest hoofed mammal is the lesser mouse deer, or chevrotain, which weighs little more than 2 pounds, around the same as a standard bag of sugar!
-  The milk produced by female Himalayan yaks is pink!

and gazelles, or they develop impressive defenses, such as the large size and fearsome horns of the African rhinoceros. Forest-dwelling hoofed mammals such as small deer, pigs, and okapis, live alone or in small groups.



1. *Male mule deer*
2. *Saola*
3. *Male ibex*



HORSES, ZEBRAS, AND ASSES

For many people, wild horses are a symbol of grace and freedom. Their close relatives, zebras, are equally admired for their exotic coat patterns, and asses are perhaps the fastest and hardest of the group.





Horses and their relatives appeared around fifty million years ago in North America. The first horses were small forest animals with three hoofed toes on each foot. They adapted to eating grass and began to live on the plains. However, it was dangerous for small, plant-eating animals to live out in the open. So, horses gradually became larger and superb runners to escape predators. Their legs grew long and slim, and their two side toes shrank away. That left one large toe, which made the foot bones much less flexible but extremely light and strong. Horses have speed, strength, and stamina. They can sprint at up to 50 miles an hour or travel all day at a steady canter.

Grazing Days

Grass is difficult to digest, especially without a large, complex stomach like that of cattle and sheep. Horses have only a simple stomach, so the grass they eat passes through quickly. Horse dung contains a lot of undigested grass. To make up for this waste, horses eat a lot of grass. They crop the grass with their large front teeth and grind it up with their large cheek teeth. These teeth have ridges of enamel that help shred and pulp the grass before it is swallowed.

Horses spend most of their days grazing. They feed standing up and can react quickly if they sense danger. A horse can relax and even snooze without having to lie down. When feeding, a horse or zebra raises its head

Closely related to horses and asses, zebras are instantly recognized because of their distinctive black-and-white stripes. They live only in Africa.

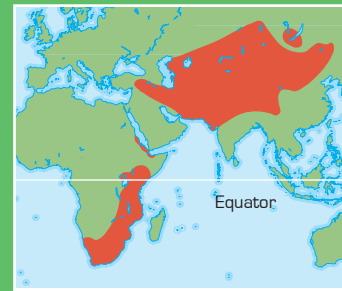
Fact File

HORSES, ZEBRAS, AND ASSES

Family: Equidae (7 species)

Order: Artiodactyla

Where do they live? Eastern Africa, the Middle East, and Central Asia



Habitat: Savanna and steppe grasslands and deserts

Size: Head-body length 6 feet
6 inches–9 feet
(200–275 cm); weight 560–890 pounds
(255–405 kg)—2,860 pounds (1,300 kg)
in domestic horse



Coat: Short and neat to slightly shaggy; varies from pale gray or fawn to black; zebras and asses have stripes; long-haired mane and tail tuft

Diet: Grass and other plant material

Breeding: 1 foal, sometimes twins; 11–14 months' gestation; weaned at 9–24 months; mature at 2–4 years

Life span: 25–45 years

Status: True horses officially extinct in wild, but millions live in captivity; African ass critically endangered; Asiatic ass, mountain zebra, and Grevy's zebra endangered

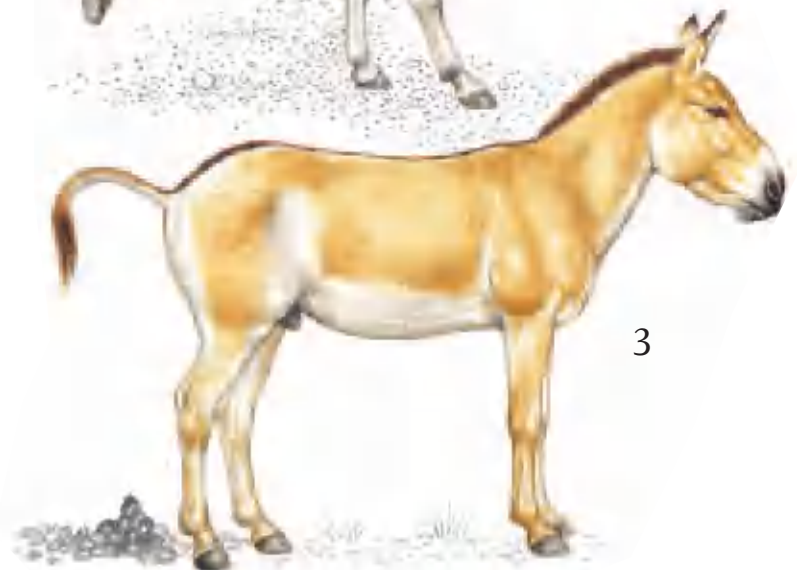
HORSES, ZEBRAS, AND ASSES






1 A male Przewalski's horse displays the stallion's bite threat. These horses are like the ancestors of all domestic horses.

2 A female African ass shows the kick threat, with its ears held back.

3 A male onager, a subspecies (local type) of the Asiatic ass, creates a pile of dung to mark its territory.



DID YOU KNOW?

-  The word *mustang* comes from the Spanish word *mesteno*, which means "belonging to nobody."
-  Horses were extinct in America until the sixteenth century, when Spanish settlers took them back to their ancestral home.
-  A horse reveals its mood by changes in its ear, mouth, and tail positions!



WHY ARE ZEBRAS STRIPY?

People used to think that the stripy coat of zebras was a type of camouflage or a way to confuse predators. Now scientists think that all horses were once stripy and that zebras kept their stripes because they help keep members of the herd together—zebras are attracted to each other's eye-catching patterns. Other horses and asses have mostly lost their stripes, although some still have faint markings on their legs.



often to check the surroundings, always alert. Even when a horse's head is down, its ears move this way and that, checking for danger.

Horses have good eyesight and hearing, but their sense of smell is not as good as that of many other hoofed animals. In the open, sound travels a long way, and it is usually easy to see what is going on, so horses use mostly sounds and body language to communicate.

Herding and Mating

Adult female horses, zebras, and asses live in herds. The females are called mares. In wild horses and plains zebras, each herd is led by an adult male, or stallion. The stallion guards his mares from other males and predators. In asses and Grevy's zebras, the stallion protects a territory. He claims the right to mate with mares that wander into his patch but does not prevent them from leaving if they choose to go. The stallion that

▲ *Each zebra has a unique pattern of black-and-white stripes.*

HORSES, ZEBRAS, AND ASSES

manages to hold onto the best territory is the most successful at mating because the mares spend more time with him.

Female horses come into season (are ready to mate) soon after giving birth. They are pregnant for a year or more. This long gestation ensures that when the foal arrives, it is well developed. A young foal can stand within minutes of being born and run within hours. That is important because, living in the open, there is nowhere to hide. A young horse or ass that cannot keep up with the herd will be easily picked off by a predator.

DID YOU KNOW?

- There are now around 2,000 Przewalski's horses alive. Most of them live in zoos and wildlife reserves.
- Przewalski's horses were named after a Polish explorer who served in the Russian army in the nineteenth century!
- The Romans called zebras hippotigres, or "tiger horses," because of their stripes!

Going Wild

Some domesticated horses and ponies have returned to the wild.

In North America, herds of mustangs live wild on the plains and in the

▼ *The African ass lives only in a thin strip of northeastern Africa. It is now critically endangered.*





MULES, HINNEYS, AND OTHER MIX-UPS

Since horses, asses, and zebras are closely related, they can sometimes breed with each other to produce hybrids. The most common hybrid is a cross between a female horse and male ass. The result is a mule (right). If the cross is between a male horse and a female ass, the hybrid is a hinney. Mules are more useful to people than hinneys because they are stronger. Zebras can also be crossed with horses to produce hybrids known as zorses.



mountains. In Europe, there are also feral horses and ponies in France and the United Kingdom. In Australia, where horses have never lived naturally, domestic horses have escaped or were set free by European settlers. These horses now have around 200,000 wild descendants, known as brumbies. That is the world's largest population of feral horses, or horses that were once domesticated but have since gone wild.

All At Risk

Of the seven species of horses, zebras, and asses, all but the plains zebra and domestic horse are at risk of becoming extinct. Przewalski's horses became extinct in the wild in 1969. Since then, zoos have been breeding these horses, and some have been returned to the wild in Mongolia. The next most threatened species is the African ass, which is critically endangered. Grevy's zebra, the mountain zebra, and the Asiatic ass are also endangered.

▲ *Mules are usually sterile—they cannot produce foals. Although a mule's ears are longer than the horse parent's, they are the same shape.*

HYRAXES

Hyraxes look like large rodents, but they are more closely related to elephants. Hyraxes are sturdy, small- to medium-sized mammals, with short legs, a stumpy tail, and a small, pointed face.





Hyraxes are expert climbers thanks to their unusual feet. The soles of their feet are covered in rubbery skin, which produces a lot of sticky sweat that helps the feet grip. The soles of the feet can form a sucker shape that allows the hyrax to cling onto extremely smooth surfaces.

Hyraxes usually live in rocky outcrops in the middle of scrublands. These outcrops provide good lookout points, warm spots for hyraxes to sunbathe, and lots of crevices for sleeping in or hiding from predators. Hyraxes have whiskers all over the body, so they can feel their way around in small spaces in total darkness.

Hyraxes eat all types of plant food and, like rabbits and certain hoofed animals, they have bacteria (single-celled microorganisms) in their gut. Bacteria help break down the toughest parts of plants and release the energy in the hyraxes' food.

Living in a Group

Hyraxes live in groups and communicate using soft chattering calls and whistles. They also use scent to mark each other and their home area. For such small animals, hyraxes breed slowly. In any one year, females raise only one litter of up to three offspring. Other members of the group help by huddling close to keep the young hyraxes warm at night. Group members also keep watch for predators, such as snakes, leopards, jackals, spotted hyenas, and birds of prey.

A hyrax has large black eyes, rounded ears, and long, touch-sensitive whiskers. If a hyrax spots danger, it produces a shrill alarm call.

Fact File

HYRAXES

Family: Procaviidae [11 species]

Order: Hyracoidea

Where do they live? Africa and parts of the Middle East



Habitat: Rocky outcrops in dry areas and forests

Size: Head-body length 12.5–24 inches (31–60 cm); weight 3–12 pounds (1,300–5,400 g)



Coat: Length and color varies with species, from short to shaggy, and from pale yellow to gray or brown; paler on the belly

Diet: Plants

Breeding: Litters of 1–3 offspring born after 7–8 months' gestation; weaned at 1–5 months; mature at 16–17 months

Life span: 12 years

Status: Three of the 11 species are listed as vulnerable



JACKALS

Jackals are sociable, smart, and tough. Adults pair up when young and stick together, working as a team to find food and rear cubs. These slender, medium-sized dogs often have a bad reputation, just as wolves do.





Jackals are related to wolves. Although slightly smaller, jackals are similar to wolves in many ways. Jackals survive well in dry habitats, where prey seems hard to find; they are not fussy eaters—they eat all sorts of different foods; and jackals are smart, agile hunters that snatch small birds and mammals and the offspring of larger animals such as antelope. Jackals also eat a lot of fruit, which provides them with water. They are great scavengers and often turn up to take a share of dead animals by roadsides. In Europe, jackals were once a common sight around graveyards, too.

A Family Affair

Once a young adult jackal finds a mate, the pair often stays together for life, finding and then defending a territory. Jackals mark out their territory using scent and move into old, abandoned animal burrows to make dens where they can breed and rear cubs.

Both parents look after the pups, and the family moves from den to den every few days. That makes it hard for predators to find them. The pups develop fast. They are first weaned onto partly digested food, which has been coughed back up by the parents. After three months they can eat whole animals, and in six months they help their parents hunt. Young jackals leave home at around one year old, although black-backed jackals sometimes stay behind for another year to help rear the next litter and learn from their parents.

A black-backed jackal drinks from a water hole, listening for danger. Some farmers shoot jackals because they kill lambs and other livestock.

Fact File

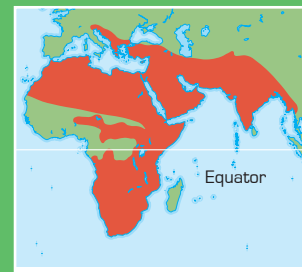
JACKALS

***Canis aureus* (golden jackal), *Canis adjustus* (side-striped jackal), and *Canis mesomelus* (black-backed jackal)**

Family: Canidae (3 species)

Order: Carnivora

Where do they live? Africa, the Middle East, southeastern Europe, and South Asia



Habitat: Grasslands, scrublands, and woodlands

Size: Head-body length 33–52 inches (83–132 cm); weight 14–33 pounds (6.5–15 kg)



Coat: Coarse, golden-fawn to gray; distinctive gray to black markings in side-striped and black-backed species

Diet: Small mammals, birds, reptiles, amphibians, insects, fruit, and carrion

Breeding: 3–4 pups born after 63 days' gestation; mature at 11 months

Life span: 4–8 years in the wild, and up to 16 years in zoos

Status: Least concern; not currently at serious risk

JUMPING MICE, BIRCHMICE, AND JERBOAS

Some of these mice can leap 10 feet in a single bound on their huge back feet. However, this active lifestyle lasts for only a few months—come the fall, they are ready to sleep for six months or more.





Jumping mice and birchmice are generally small, at no more than 4.5 inches long, but their tail is up to twice as long. They are about half the size of their cousins, the jerboas. Jumping mice and birchmice live in seasonal grasslands and forests. They spend the summer leaping around in search of food, mainly insect grubs and fungi, which they catch and eat using their front paws. The back feet of jumping mice are large and long—like those of tiny kangaroos.

Fattening Up in the Fall

In the fall, jumping mice and birchmice fatten up on rich, oily, and sugary food, such as seeds and berries. They increase their body weight by up to one-third in just two weeks. When the food supply begins to decrease, jumping mice and birchmice hibernate in the burrow of another small mammal or find a hollow log stuffed with leaves. They sleep so deeply that they seem almost dead. Their body grows cold and their heart rate slows down to just one or two beats a minute. By using so little energy, these small animals can make their tiny store of body fat last until spring.

Jerboas live in African and Asian deserts. They breed and sleep in sand burrows, which they dig with their huge back feet. Tufts of fur on the feet act like snowshoes, helping the mice jump around on loose sand. Jerboas eat mainly seeds and fruit and get all the water they need from their food.

A jerboa dashes across the desert. These small rodents have an extremely long, tufted tail and large hind legs for bounding along and for digging.

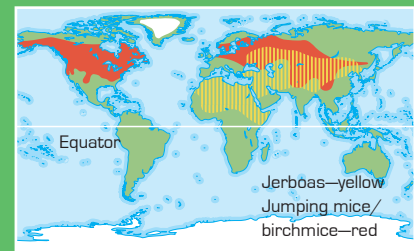
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JUMPING MICE, BIRCHMICE, AND JERBOAS

Family: Dipodidae (50 species)

Order: Rodentia

Where do they live? North America, Eastern and central Europe, northern Africa, and Asia



Habitat: Meadows and other grasslands, moors, thickets, forests, and deserts

Size:

Head-body length 2–9 inches (5–23 cm);
weight 0.2–14 ounces (6–420 g)



Coat: Usually coarse, but silky in jerboas; fawn to reddish or grayish brown

Diet: Seeds, shoots, berries, fungi, and insects and their grubs

Breeding: Litters of 2–6 offspring born after 17–35 days' gestation

Life span: Up to 2 years in jumping mice and birchmice, and 3 years in jerboas

Status: 7 species are at risk; some are critically endangered



KANGAROOS AND WALLABIES

When people think of a kangaroo, they usually imagine a red kangaroo hopping across the Australian desert. But the red kangaroo is only one of seventy-six species, including many wallabies, several ratlike forest animals, and even some kangaroos that live in trees.





There are more than seventy species (types) of kangaroos. Some, such as the red kangaroo and the eastern gray kangaroo, are large and well known. But many kangaroos are small, shy, and live in remote deserts or dense forests where they are not often seen.

Kangaroos and wallabies are the most numerous and well-known marsupials. Marsupials are animals that rear their offspring in a pouch on the front of the female's body. In kangaroos, the pouch contains two teats, but usually just one baby, or joey, is born at a time. The newborn joey is tiny and furless, with undeveloped eyes, hind limbs, and tail. It crawls through its mother's fur to the pouch and latches onto a teat with its mouth. It stays there until it has grown much larger and stronger, its eyes have opened, and its fur coat has grown. It can take anything from five to eleven months for a joey to be ready to leave the pouch for good. After that, it may leave its mother to live alone or stay close by as it continues to grow.

Kangaroo Mobs

Forest species, such as tree kangaroos and rat kangaroos, usually live alone, except for mothers with offspring. Kangaroos that live in the open in grasslands or deserts live in groups called mobs. Each group consists of one large male and several adult females and their offspring. The females are often related to each other. Young males usually leave the group when

Always on the alert, this eastern gray kangaroo pauses while feeding to check its surroundings. It supports itself on its huge hind legs and long tail.

Fact File

KANGAROOS AND WALLABIES

Family: Macropodidae (76 species)

Order: Diprotodontia

Where do they live? Australia and the island of New Guinea



Habitat: Deserts, grasslands, scrublands, and temperate and tropical forests

Size: Head-body length 11–65 inches (28–165 cm); weight 1.2–200 pounds (0.5–95 kg)



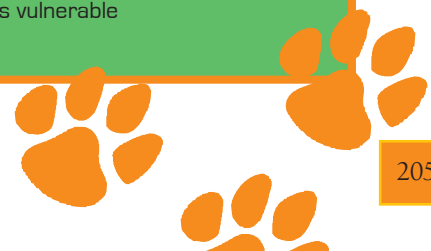
Coat: Fine, dense, and slightly fluffy or shaggy looking; pale gray to red, brown, or black; some species have markings on the face, legs, and tail

Diet: Plants, including grass, leaves, shoots, seeds, roots, and fungi

Breeding: 1 joey (rarely twins) born after 30–39 days' gestation; reared in pouch; weaned at 4–11 months

Life span: Varies with species; 5–18 years in the wild, and 28 years in zoos for large species

Status: Gilbert's potoroo critically endangered; 9 species endangered; 12 species vulnerable



KANGAROOS AND WALLABIES

they become mature, but young female joeys stay and learn how to raise offspring from their mother and other female relatives.

Tough Plant Food

Kangaroos and wallabies are plant eaters, but various species eat quite different sorts of plant foods. Many forest-dwelling kangaroos eat roots and tubers. Some larger species, such as gray kangaroos, euros, and

pademelons, eat mainly grass. The desert-dwelling red kangaroo eats dry grass and the leaves of desert shrubs such as saltbush.

Kangaroos have bacteria (single-celled microorganisms) living in their gut that help digest tough plant material. Kangaroos spend a long time digesting their food, making sure they get as much goodness from it as possible. By making the most of every mouthful, they can survive on

▶ *A red-necked wallaby joey pokes its head out of its mother's pouch. It spends many months in the safety of the pouch, coming out occasionally to hop around.*

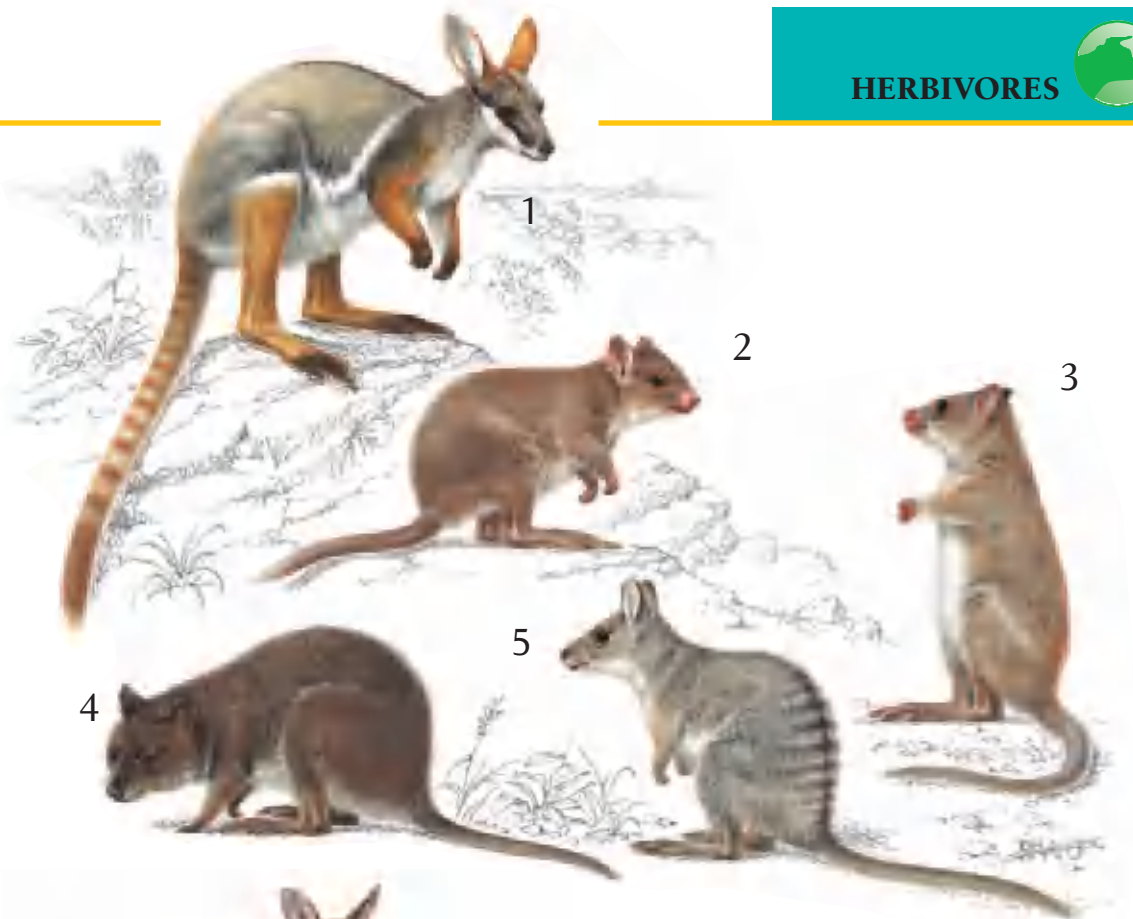


TWO MOUTHS TO FEED

In large kangaroos and wallabies, a joey that has left its mother's pouch still needs milk for a few more months. A joey suckles by sticking its head into the pouch to find the teat. By this time, there may be a new, younger joey in the pouch, and the two offspring use different teats. The mother kangaroo produces two different sorts of milk from each teat, so each youngster gets exactly the right nutrients.



1. *Yellow-footed rock wallaby*
2. *Burrowing bettong, or boodie*
3. *Rufous rat kangaroo*
4. *Quokka*
5. *Banded hare wallaby*
6. *Proserpine rock wallaby*



of Western Australia. These animals get all the water they need from their food or by licking up dew in the morning.




Huge Hind Feet and Tail

Kangaroos and wallabies have small front legs and

feet, with five fingers and strong claws. They use these claws for fighting, digging, and holding food. The hind legs and feet are completely different. The legs are long, with huge muscles in the thighs, which are used

very poor food, including old dried-up grass and the tough leaves of desert shrubs. Desert kangaroos can go for weeks without drinking, as do red kangaroos and the tiny quokkas

DID YOU KNOW?

-  One-quarter of all kangaroo species live outside Australia, on the large island of New Guinea.
-  Kangaroos can hop at up to 35 miles per hour!
-  The group name for kangaroos and wallabies is macropod, which means "big foot" in Greek!

KANGAROOS AND WALLABIES

for hopping. The hind feet are extremely long, and each has four toes. The outer two toes are the largest, and they carry the animal's weight when it is standing or hopping. The inner two toes are fused, making a double toe with two claws. These claws are used like a comb for cleaning the fur.

As well as hopping, kangaroos can move on all fours. They lean on their front legs and swing the back ones forward. All kangaroos have a

long tail. In smaller species the tail is carried off the ground and helps with the kangaroo's balance. In large species, the tail is thick and strong and can be used like an extra leg to help support the animal's weight when standing or moving around. Rock wallabies have bumpy skin on the soles of their back feet, which provides great grip, even on smooth rocks. Tree kangaroos can climb, using their front paws to grip branches and pull themselves up.

▼ *An old kangaroo, such as this one, will have worn out and lost many of its teeth as a result of its tough plant diet.*

KANGAROO TEETH

Kangaroos have just one pair of front teeth, called incisors, in the lower jaw and two pairs of incisors in the upper jaw. These teeth have sharp edges and are used for cutting grass and leaves or biting chunks off roots or fruit. The cheek teeth are large and each one has a series of sharp ridges that grind food to a pulp. These teeth move forward in the kangaroo's mouth as the animal gets older to replace worn-out teeth, which fall out.





▲ *A tree kangaroo snoozes in the branches of a tree.*

Large Herbivores

Kangaroos have a great deal in common with other large herbivores, such as antelope. Both kangaroos and antelope have grinding teeth, a long gut, and a large stomach containing bacteria to help digestion. Both also use sharp senses and speed to avoid predators. Kangaroos have eyes on the sides of the head, which give good all-around vision, and ears that turn this

DID YOU KNOW?

- 🐾 Kangaroo meat is a very healthy low-fat alternative to beef.
- 🐾 The smallest kangaroos are called rat kangaroos. They are around a foot long and have a long, skinny tail.
- 🐾 Only male red kangaroos are red. The females are bluish gray—and local people call them blue fliers!

way and that. Kangaroos also have long legs and can move fast, making great leaps that might confuse a chasing predator. Kangaroos live alone in forests, but they live in groups in open grassland, where many pairs of eyes and ears make it hard for a predator to sneak up.

Several types of kangaroos are at risk of becoming extinct. Forest species, like tree kangaroos, have lost habitat as people clear the land for farming. Smaller species, such as potoroos, are killed by predators such as dogs and foxes brought to Australia and New Guinea by people. Red and gray kangaroos are not threatened, but sheep farmers treat them as pests. Tens of thousands are shot for meat or skins or just for sport, and many more are killed on roads every year.

KOALA

The koala is one of the world's most loved animals, with its teddy-bear face and fluffy ears. But these cute-looking animals have a tough side, too—they are the only mammal that can survive by eating the leaves of eucalyptus trees.





Koalas spend most of the day sitting in the fork of a tree and snoozing. Some people think that koalas are lazy or even that they are affected by the poisonous chemicals present in the eucalyptus leaves they eat. The truth is that eucalyptus leaves do not contain much energy. Koalas climb slowly to save energy. The only way in which a koala can survive on eucalyptus leaves is by getting lots of rest and not rushing around. The other alternative would be to eat much more, but eucalyptus leaves take so long to digest that koalas simply do not have the time to spend eating more leaves. In addition, the leaves contain many poisonous chemicals, and it might be dangerous for a koala to eat a larger quantity of them.

A Gripping Time

Koalas make hanging about in trees look easy. They climb by gripping the tree with all four paws, pushing up with their back legs, and pulling with their front legs. They have superb balance and can walk along narrow branches. The palms and soles of their paws are bald, and the rough skin provides excellent grip. On the front paws, the first two fingers act as thumbs, making the koala's grip strong. On the hind feet, the second and third toes are joined to make a double toe with two claws. All the fingers and toes have a large, curved, and sharp claw that hooks into tree bark. Koalas spend as little time on the ground as possible.

Fast asleep in the fork of a tree, this koala balances by gripping with its long, sharp claws. Koalas save energy by snoozing for most of the day and night.

Fact File

KOALA

Phascolarctos cinereus

Family: Phascolarctidae

Order: Diprotodontia

Where do they live?

Eastern Australia



Habitat: Eucalyptus trees

Size: Head-body length
23.5–33.5 inches
(60–85 cm); weight
9–33 pounds (4–15 kg)



Coat: Fluffy and dense; usually gray with a light reddish tinge; white on chest

Diet: Leaves of the eucalyptus and a few other trees

Breeding: 1 joey born after 35 days' gestation; weaned at 6–10 months; mature at 2 years

Life span: Up to 18 years

Status: Once seriously threatened; now at lower risk



KOALA

► *Koalas can balance on even the thinnest of branches. They spend most of their time high up in eucalyptus trees. They do not move around very much because they have a low-energy diet.*

They usually come down only to move to another tree. On the ground, they waddle on all fours, and if they have to move quickly, they break into a bouncy gallop.

Koalas live alone. Each koala uses just a few favorite trees and never wanders very far. Often, there are several unrelated koalas living in the same patch of trees. They pay very little attention to each other most of the time. That changes during the breeding season, when the largest male koala tries to drive all the other males out of his area so that he can have the females to himself for mating. Koalas are silent most of the time, but the males make loud growling calls throughout the night in the breeding season.

Tiny Koala Joeys

After mating, a female koala is pregnant for one month before giving birth to a tiny, naked baby. A newborn koala joey weighs around the same as a single peanut. The joey



SAVING THE KOALA

Koala fur is extremely thick and soft, and was once prized by people, who hunted the koala almost to extinction in the nineteenth century. Hunting koalas is now banned, and people are eager to protect them. The main problem now is that many of the forests where koalas live have been cut down, leaving them to survive in small, overcrowded patches where there is not enough food and where diseases spread easily.






⚠️ *When a koala moves, it does so extremely slowly and cautiously.*

has to climb into its mother's pouch and find one of her teats. It stays there for six months, growing fast.

When the baby koala is ready to start eating solid food, its mother produces soft droppings, called pap. The baby eats the pap, which contains partly digested eucalyptus leaves. Fresh eucalyptus leaves are much too tough for the young joey to digest, and they also contain chemicals that are poisonous. By starting off on pap, the young koala's digestive system slowly gets used to

its diet. The pap also contains bacteria from the mother's gut, which stay inside the young koala and help it digest more leaves in the future.

DID YOU KNOW?

-  Koalas are not bears—they are marsupials, and their closest relatives are wombats!
-  Koalas sometimes eat soil and gravel to help them digest their diet of leaves!
-  Koalas sleep for around twenty hours a day!

LEMURS

Lemurs and their relatives live only on Madagascar, a large island off the east coast of Africa. These lively and appealing mammals live mostly in forests and are agile climbers.





Wide-eyed and nimble lemurs belong to the order (large group) Primates, which includes apes and monkeys. Lemurs belong to the suborder Strepsirrhini, or moist-nosed primates, along with bushbabies (galagos), lorises, and pottos. There are around sixty species of lemurs, which live on Madagascar or nearby islands. Madagascar, the world's fourth-largest island, lies off the east coast of Africa. It has many different habitats, including rain forests, scrublands, rocky areas, and deserts. The different types of lemurs are suited to live and feed in these varied environments. For example, many lemurs spend their lives in trees, but some live mostly on the ground.

All Shapes and Sizes

Lemurs are many different shapes and sizes. The smallest are tiny creatures weighing less than an ounce, while the largest may weigh 17 pounds. Some lemurs look like monkeys, while others resemble mice. Some lemurs have a compact body with short limbs; others are long and slender. Most lemurs have a long, bushy tail, but the indri has a short, stumpy tail.

Scientists divide lemurs into five groups: typical lemurs; sportive lemurs; dwarf and mouse lemurs; indris and sifakas; and the aye-aye. Typical lemurs include the ring-tailed lemur, with its striking black-and-white striped tail. Sportive lemurs are small forest dwellers. Indris and sifakas are large lemurs—the indri

Black-and-white ruffed lemurs are the largest of the typical lemurs. They are named for the distinctive ruff of white fur around the head.

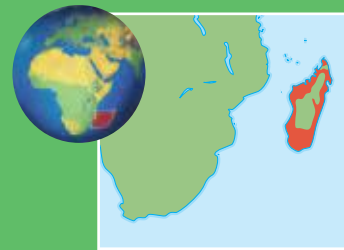
Fact File

LEMURS

Families: Lemuridae (19 species of typical lemurs); Lepilemuridae (8 species of sportive lemurs); Cheirogaleidae (23 species of dwarf and mouse lemurs); Indridae (11 species of indris, sifakas, and woolly lemurs); and Daubentoniidae (1 species of aye-aye)

Order: Primates

Where do they live? Madagascar and nearby small islands



Habitat: Rain forests, woodlands, grasslands, scrublands, and deserts

Size: Head-body length:
4–28 inches (10–70 cm);
weight: 0.8 ounce
–17 pounds (25 g–7.5 kg)



Coat: Brown, gray, or black;
some have patches or stripes

Diet: Leaves, fruit, flowers, nectar, sap,
and gum; some species also
eat insects and even reptiles

Breeding: 1–4 offspring born
after 2–5 months' gestation

Life span: 5–20 years in the wild; some
species up to 35 years in zoos

Status: Some are vulnerable



LEMURS

looks like a woolly bear. Mouse and dwarf lemurs are tiny and delicate, while the aye-aye is a highly unusual insect-eating lemur (see opposite).

Feeding and Lifestyle

Lemurs vary a great deal in their feeding habits. Most eat plants, with various species eating mainly leaves, fruit, flower nectar, or other plant parts. Fork-crowned dwarf lemurs feed on gum oozing from tree trunks. Mouse lemurs eat small creatures, such as insects. A few lemurs hunt larger prey such as reptiles.

Lemurs vary in their habits. Many are nocturnal (night active); others are active at dusk and dawn. Ring-tailed lemurs are active during

daylight, while some lemurs move about at any time of the day or night.

Aye-ayes, mouse lemurs, and dwarf lemurs mostly live alone, except for females with their babies. Other species, such as ring-tailed lemurs and indris, live in noisy groups called troops. Between fifteen and thirty of these lemurs live, rest, and raise their offspring together. Troop-living

1. *Gray bamboo lemur*
2. *White-headed lemur*
3. *Brown lemur*
4. *Black-and-white ruffed lemur*
5. *Ring-tailed lemur*
6. *Hairy-eared dwarf lemur*





THE AYE-AYE

The aye-aye is an extraordinary looking lemur, with large, round eyes and long, clawed fingers. It feeds at night, hunting insect grubs that live under the bark of trees. The aye-aye taps on the bark with its long, bony second finger to disturb the grubs. Its large, batlike ears pick up the tiny rustling sounds made by the insects. The aye-aye then digs under the bark and hooks out the juicy grubs with its long, thin middle finger.



lemurs usually have feeding territories, where rival troops are not welcome. Ring-tailed lemurs smear scent from glands under their arms or near their tail to mark their territories.

Breeding and Conservation

The various species of lemurs have different breeding habits. Some species breed at a particular time of the year, while others mate at any time. Large lemurs, such as indris, breed slowly. The females produce one or two babies around five months after mating. The offspring stay with their mother for up to a year. Small species, such as mouse lemurs, breed more quickly. The females give birth to up to four babies just two months after

mating and may breed twice a year. Mouse lemurs grow up quickly and become independent at around four months.

Some types of lemurs are widespread, but others are rare, and some are in danger of dying out completely. The main threat to lemurs is the destruction of forests and other wild places where they live to make way for new farms and towns for people.

DID YOU KNOW?



Just a few thousand years ago, giant, gorilla-sized lemurs lived on Madagascar, but these animals have now died out!



Since 2000, scientists have discovered several new species of mouse and dwarf lemurs.

LEOPARD

One of the largest members of the cat family, the leopard is an expert hunter. These cats use their sharp teeth and claws to kill their prey.





Leopards are among the biggest cats, smaller than lions, tigers, and jaguars but heavier than cheetahs. Leopards have a sturdy build, with a long, powerful body, a rounded head, and fairly short legs. Some leopards are black all over and are sometimes called black panthers; they are quite common in Southeast Asia. However, most leopards have a pale or tawny coat, covered with black spots. The spots are arranged in circular patterns called rosettes over the upper body, with smaller spots on the head, chest, and legs. This spotted coat provides excellent camouflage, helping the leopard blend in with its surroundings. That allows the leopard to creep up on its prey.

The leopard is the most widespread cat apart from the domestic (pet) cat. Leopards live in many parts of Africa and southern Asia, and also in Arabia. They are at home in many different habitats, including rain forests, mountains, deserts, and even on the edge of towns. There are two reasons for the leopard's success: its shy and stealthy nature and its unfussy feeding habits.

Stealthy Hunters

Like all cats, leopards are carnivores, or meat eaters. They catch a wide range of prey, including mammals from antelope to monkeys, and also reptiles and birds. Leopards feed on carrion (dead animals), too.

Leopards hunt alone and usually at night, especially in areas where there are people. They find their prey

Perched high in a tree, a leopard uses its excellent sense of sight to keep watch over its territory. Leopards also have a keen sense of hearing.

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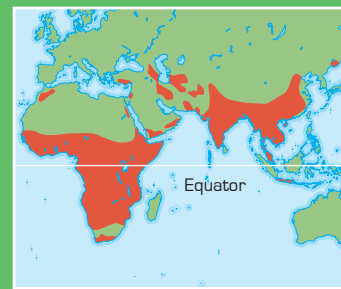
LEOPARD

Panthera pardus

Family: Felidae

Order: Carnivora

Where do they live? Africa, southern and Southeast Asia, Arabia



Habitat: Varied, from tropical rain forests to deserts, mountains, and even near towns

Size: Head-body length 40–75 inches (100–190 cm), tail 28–37 inches (70–95cm); weight 66–155 pounds (30–70 kg); males are larger than females



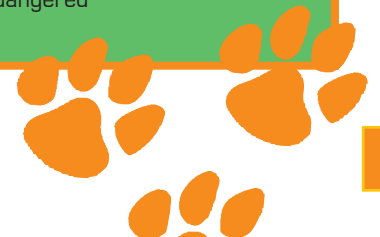
Coat: Usually fawn to tawny, with black spots; some are black

Diet: Reptiles, birds, and small- to medium-sized mammals

Breeding: 1–2 (maximum 6) cubs, born after 90–105 days' gestation

Life span: Up to 14 years in the wild, and 20 years in zoos

Status: Generally not threatened, but some subspecies (local populations) critically endangered



LEOPARD

using their keen senses of hearing, smell, and sight. Stiff whiskers on the leopard's snout are used for night-time navigation. Their large eyes see well at night. After finding its prey, a leopard creeps closer, hiding among the plants and bushes. Its spotted coat helps the leopard get close without being seen. When it is around 6.5 feet from its prey, the leopard pounces and sinks its claws

into the victim, killing the prey by biting the back of its neck.

Large prey such as antelope provide food for several meals. Having eaten its fill, the leopard saves the rest for later. It usually hides the kill among thick bushes, sometimes dragging the body for several hundred yards. Leopards also drag their half-eaten prey into tree branches, away from the reach of scavengers such as hyenas.

▶ *A pair of leopard cubs snuggle down in the safety of their lair.*



LEOPARD LIFE CYCLE

Leopards breed at any time of the year. Females give birth around three to four months after mating, in the safety of a rocky lair or among thick bushes. Only one or two cubs are usually born at a time. These blind, furry babies weigh just 15–20 ounces. The cubs start to follow their mother at six to eight weeks old and go with her on hunting trips at three months old. They become independent at eighteen to twenty months old.



Taking a Territory

Leopards mostly live alone, except for females with their cubs. Each leopard has a territory called a home range, where it hunts and rests between meals, often safe in a tree. The size of the home range varies, depending on the number of prey in the area. Where there are fewer prey, a leopard needs a larger territory. Each female leopard has a home range of 4 to 112 square miles, which often partly overlaps with the range of other females. Male leopards have a larger home range, varying from 7 to 440 square miles. These areas may overlap with the territories of other males and females.

Threats and Conservation

In many areas, leopards are thriving, partly thanks to their unfussy diet. However, numbers of leopards are falling in some places because of human activities. For example, farmers and herders shoot or poison leopards when the cats enter farmland and hunt domestic animals. As farms and villages grow, so there is less and less wild land where leopards can hunt in peace.

People also kill leopards for sport. Large numbers of leopards were



once shot by trophy hunters, but now sport hunting is carefully controlled. Leopards are usually safe from hunters in areas that have been made into preserves and national parks. Instead of hunters, increasing numbers of tourists now visit these protected places, hoping to get a glimpse of these magnificent animals in the wild.

▲ *After a busy night hunting, a leopard rests safely, high in the fork of a tree.*

DID YOU KNOW?



Leopards occasionally kill and eat other meat-eating animals, such as cheetahs and bat-eared foxes.



Leopards spray urine and leave dung at the borders of their territories, so that visiting leopards know that the area is already taken.

LION

Lions are the largest members of the cat family. The lion's strength and fierceness have earned it the title, "king of the jungle."





Lions are strong and muscular. These big cats have a short head and powerful jaws, which are suited to killing and eating large prey. The lion's coat is pale to tawny brown. The male's magnificent mane does not reach full size until he is four or five years old. Adult male lions can weigh up to 530 pounds. They are considerably larger and heavier than fully grown females. Their greater size allows them to hunt larger prey than lionesses hunt and feast first on a group kill.

Group Life in the Pride

Unlike most cats, lions are social animals. They spend much of their life in a group called a pride. The pride is usually made of three to ten adult females and their cubs, plus two or three adult males. Some prides contain as many as eighteen adult females and ten adult males. The females in a pride are close relatives, but they are almost never related to the males. The males form a separate group within the pride. They might be brothers, cousins, or unrelated to each other.

Each pride has its own territory—an area where the group hunts and which it defends against other lions. Territory sizes vary greatly, from 8 to 200 square miles. Territory size depends on the size of the pride and whether prey is scarce or plentiful. If there is little prey, the lions need a larger territory in which to hunt. Males in the pride patrol the group's territory. They mark the borders by roaring and by

A male African lion reveals his fearsome teeth as he roars. Lions have four long, sharp canine teeth, which they use to grasp and kill their prey.

Fact File

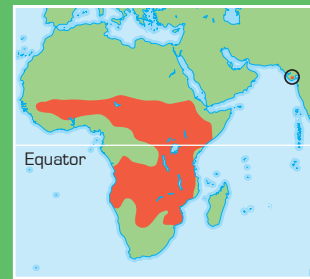
LION

Panthera leo

Family: Felidae

Order: Carnivora

Where do they live? Africa, south of the Sahara desert, and Gir Forest Sanctuary in Gujarat, India



Habitat: Varied, from dry woodlands to grasslands and deserts

Size: Head-body length of male 8.5–10.8 feet (1.7–2.5 m); weight of male 330–530 pounds (150–240 kg)



Coat: Light to dark tawny; male's mane varies from pale to reddish brown or black

Diet: Hoofed mammals, such as gazelles, antelope, and zebras; also rodents, birds, and reptiles

Breeding: 2–4 cubs born after 110–119 days' gestation; independent after 2.5 years

Life span: Up to 18 years in the wild, and up to 25 years in zoos

Status: Vulnerable; Asian lions are critically endangered



LION

spraying smelly urine. These scent signals linger for a long time, telling other lions that the area is occupied.

Hunting and Feeding

Lions mostly feed on hoofed mammals, such as gazelles, zebras, and wildebeests. Lions also hunt rodents, hares, birds, and reptiles, and occasionally elephants and rhinoceroses. Male lions chase large, slow-moving prey, such as buffalo and giraffes. Females mostly target smaller prey, such as warthogs, gazelles, and springboks. Lions rely

🦁 *This male African lion is dragging away a zebra to make sure that he gets all the meat he wants.*

DID YOU KNOW?

- 🐾 A male lion can eat 95 pounds of meat in a single meal!
- 🐾 Lions go for three or four days without feeding after eating a big meal!
- 🐾 Lions are among the few predators that regularly kill large mammals weighing more than 550 pounds, such as buffalos and giraffes!

mainly on sight and hearing to find their prey. They hunt mostly at night, but during the dry season they may ambush prey at water holes by day.





Lions in a pride often cooperate when hunting. The group can tackle larger prey than a single lion could manage on its own. Lions mostly work together in this way when small prey is scarce. When hunting together, lions spread out to surround a victim and cut off its escape. Females do most of the hunting, but once the prey is dead, the males move in and drive away the females until they have eaten their fill.

Lions can run at speeds of 36 miles per hour over short distances. However, hoofed animals, such as gazelles, can run much faster. Lions therefore use stealth to get within around 50 feet of their prey before launching an attack.

Once in range, the lions charge and seize the flanks of the prey with their sharp claws or knock the animal off its feet with a swipe of their powerful paws. The lion then clamps onto the victim's throat or muzzle with its powerful jaws and teeth until the prey dies of suffocation.

The Lion's Life Cycle

Lions breed at any time of the year. The females are able to breed at thirty to thirty-eight months old. They then give birth to cubs around



ROARING SUCCESS

A lion's roar can be heard up to 5 miles away. The males in a pride roar to announce their ownership of a territory to rival prides. They roar mainly at night, when sounds carry a long way in the still air. The rival pride answers by roaring back. A listening lion can tell whether the roaring is made by a male or female, friend or foe. As well as roaring, lions also make many other noises, including friendly whimpering sounds to their cubs.

LION

🔺 *A group of young lion cubs huddles together for warmth and security.*

once every two years, until they are fifteen years old. The males father all the cubs in the pride. However, these groups of adult males remain with the pride for only a few years. As a

result, a female's cubs born in different years usually have different fathers.

Lion cubs are born around 110 days after mating, which is a relatively short time for such a large mammal.



GROWING CUBS

Young lions learn hunting skills by playing with each other and watching the adults. They start to eat solid food by three months old and are able to hunt for themselves by around eighteen months old. While young females stay in their

mother's pride, young males go off together in search of a new pride after they reach two years old. The male's mane starts to grow at around two years old and then gradually gets darker until the lion is nine or ten years old.




Lionesses give birth to between one and six cubs at a time, but two or three cubs are most common. If several females in a pride give birth around the same time, the mothers rear their cubs together. They even provide milk for one another's cubs.

Threats to Survival



Lions live in Africa south of the Sahara, and in the Gir Forest region in northwestern India. Lions are not in danger of extinction, but they once lived in a much larger area than they now do. Until around 10,000 years ago, lions also lived across Europe and North America. They also lived in the Middle East and across northern India until the early 1900s.

Over the centuries, lions have become rarer. One of the main reasons is that people have built farms and ranches in the wild places where lions hunt. In addition, farmers and herders sometimes kill lions to protect themselves and their animals. Lions were also once shot by European hunters. Now, lions live mainly in national parks and game preserves, where they are fairly safe from hunters and other dangers. However, some lions are still killed by poachers or local herders.



 *A male lion drinks at a water hole, keeping a watchful eye on his surroundings.*

DID YOU KNOW?

-  Only around one in every four lion hunts ends in a kill.
-  When times are hard, up to 80 percent of lion cubs die before reaching one year old. Ninety percent of cubs survive in good years.

MARMOSETS AND TAMARINS

Marmosets and tamarins are small monkeys that live mostly in South American forests. These lively little creatures have colorful fur and many have unusual “hairstyles,” including long fringes, manes, and tufts.





Marmosets and tamarins are one of two groups of monkeys that live in the Americas, or New World. The other group of American monkeys is simply known as New World monkeys. There are more than forty species of marmosets and tamarins. Like all New World monkeys, they have a flattish face with widely spaced nostrils. However, unlike other New World monkeys, marmosets and tamarins have claws rather than nails. They also usually give birth to twins instead of a single baby, as other American monkeys do. Marmosets and tamarins are sociable mammals that spend their lives in groups. All the marmosets and tamarins in a group help rear the offspring.

Sizes and Shapes

Marmosets and tamarins are among the world's smallest primates, an order (large group) that includes apes and monkeys. The smallest species of marmosets and tamarins are the size of mice, while the biggest are larger than squirrels. The very smallest species, the pygmy marmoset, measures just 7 inches long, with a 7.5-inch tail. Lion tamarins are the largest members of the group. They are named after the spectacular ruff of long hairs around their neck, which resembles a lion's mane.

Marmosets and tamarins have fine, silky fur. Fur color varies from golden-orange to white, silvery, gray, reddish brown, and black. Some species have beautiful

The pygmy marmoset is the smallest in the marmoset and tamarin family. It is around 15 inches from head to tail tip and weighs up to 6.7 ounces.

Fact File

MARMOSETS AND TAMARINS

Family: Callitrichidae (41 species)

Order: Primates

Where do they live? Central America and northern South America



Habitat: Mainly tropical rain forests; also drier forests and pockets of forest in grasslands

Size: Head-body length 7–16 inches (18–40 cm); weight 9–13.5 ounces (260–380 g)



Coat: Fine, silky fur varies from white to golden-yellow, gray, red-brown, or black; many species have manes, mustaches, ear tufts, or crests

Diet: Fruit, flowers, nectar, tree gum, frogs, snails, lizards, spiders, and insects

Breeding: Usually twins, born after 130–170 days' gestation; some species breed twice a year

Life span: Up to 16 years in zoos


Status: Lion tamarins and some other species are in danger of dying out, mainly because of forest destruction




MARMOSETS AND TAMARINS

markings and many have unusual “hairstyles,” including ear tufts, manes, and mustaches. For example, the emperor tamarin is a dark gray monkey with a long, flowing white mustache and an orange tail. The cotton-top tamarin has a crown of long, silvery white fur. The golden lion tamarin is golden orange all over.

DID YOU KNOW?

 Lion tamarins have extremely long hands and fingers, which they use to reach inside rotten logs and tree holes to fish out insects.

 Marmosets feed on insects disturbed by columns of fierce army ants as they march through the forest!

1. *Goeldi's monkey*
2. *Silvery marmoset*
3. *Buffy-tufted-ear marmoset*
4. *Black-tufted-ear marmoset*
5. *Black-tailed marmoset*
6. *Geoffroy's tamarin*
7. *Golden-headed lion tamarin*
8. *Santarém*
9. *Emperor tamarin*
10. *Mustached tamarin*
11. *Red-bellied tamarin*
12. *Pygmy marmoset*
13. *Cotton-top tamarin*
14. *Mottle-face tamarin*
15. *Saddle-back tamarin*





Forest Dwellers

Marmosets and tamarins live in forests in South and Central America. They are most plentiful in the basin of the Amazon River, which covers a vast area of northern South America. They mainly live in lush tropical rain forests, which are warm and wet all year round. Species such as the pygmy marmoset live near rivers that flood regularly. Some species of marmosets and tamarins live in drier forests or patches of forest that grow in grasslands.

Marmosets and tamarins spend their lives in the trees and rarely descend to the ground. These agile little monkeys bound and leap along the branches in the manner of squirrels. Unlike some New World monkeys, marmosets and tamarins do not have a prehensile (grasping) tail, which other monkeys curl around branches like an extra limb.

In the last century or so, huge areas of South American rain forests have been cut down for hardwood timber, fuel, or to make way for new farms, mines, roads, and towns. Some species of marmosets and tamarins, including lion tamarins, are now in danger of dying out as a result of forest destruction (see overleaf).



NEW DISCOVERIES

Marmosets and tamarins are small. Many species are also scarce and live only in a small area. All these things help explain why many species were unknown until quite recently. Since the late 1980s, scientists have identified at least eight new species of these monkeys. The black-faced lion tamarin (above) was discovered in 1990, for example. An unusual species, the tiny dwarf marmoset of the Aripuana River in Brazil, was identified by experts only in 1996.

MARMOSETS AND TAMARINS



LION TAMARINS IN DANGER

Lion tamarins are large tamarins famous for their long, silky manes. There are four extremely rare species, including the golden lion tamarin (above). Lion tamarins live in coastal forests in southeastern Brazil. However, 95 percent of these forests have now been cut down. Fewer than 1,000 individuals of some species are left. Conservationists are trying to save these animals by breeding them in zoos and then releasing young lion tamarins into the wild.

Feeding the Monkeys

Marmosets and tamarins feed on both plant and animal foods. They eat fruit, flowers, nectar, and the gum that oozes from trees when the bark is damaged. Some marmosets make sure they have a regular supply of gum by gouging holes and grooves in gum tree trunks. These little monkeys also hunt small animals, such as frogs, snails, spiders, lizards, and insects, such as grasshoppers and beetles. They also eat birds' eggs and even young birds.




Marmosets and tamarins are active mainly by day. They spend the day moving slowly through the trees as they search for food. Species such as cotton-top tamarins travel around one mile a day. At dusk, they return to their regular sleeping tree. They spend the night curled in a fork in the branches or in a tree hole.

Social Life and Breeding

Marmosets and tamarins live in groups of between four and twenty monkeys. Small groups consist of a mother, a father, and their young. Larger groups contain the breeding pair's grown-up offspring, who help rear the newborns. The monkeys in a group stay in close touch. They



DID YOU KNOW?


-  Saddle-back and mustached tamarins move through the forest in mixed-species groups.
-  Mustached tamarins search for food high in the treetops, while saddle-backs hunt nearer the ground.
-  Young marmosets and tamarins spend a lot of time playing—they wrestle and chase one another through the treetops before reaching adult size at around two years old.

rest huddled together, play-fight, and also comb one another's fur to remove dirt and fleas. Group members have many ways of communicating with one another. They use scents, different facial expressions and gestures, and all sorts of sounds.

Each monkey group has a particular area in which it feeds, called a home range. The group marks its territory with scents from glands on each monkey's chest and abdomen. These scents warn rival groups to keep away. The monkeys also make warning noises and threatening movements, fluffing out their fur and raising their mane or tail to make themselves look larger.

Within each monkey group, there is usually only one female that produces babies. However, large groups contain several adult males for her to mate with. Females produce one or two offspring, usually twins, from 130 to 170 days after mating.

Newborn marmosets and tamarins are large and heavy—a pair of twins can weigh up to one-quarter of their mother's weight. Not surprisingly, the mother needs help in carrying her babies. Older brothers and sisters help raise the young monkeys. They carry their small brothers and sisters as the group moves through the forest and even provide them with food.

 *Emperor tamarins have an extremely long and distinctive mustache. They also have an orange tail.*



MARSUPIALS

Marsupials are a group of mammals with unusual breeding habits. Their offspring are born early, before they are fully developed. They finish developing inside their mother's pouch. Australia is famous for its many marsupial species.

Scientists divide all mammals into three main groups, according to the way their offspring develop. The largest group, placental mammals, includes mice, bats, whales, dogs, and monkeys. In these mammals, the offspring develop inside the mother's womb, where they are nourished by an organ called the placenta. Marsupials, also known as pouched mammals, are the second-largest group of mammals.

1. *Mahogany glider*
2. *Common ringtail possum*
3. *Tasmanian pygmy possum*
4. *Leadbeater's possum*
5. *Striped possum*
6. *Feathertail glider*
7. *Sugar glider*
8. *Kangaroo Island dunnart*

1



2

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12

13

9. Common brushtail possum

10. Numbat

11. Scaly-tailed possum

12. Gray or northern common cuscus

13. Spotted cuscus

Marsupials do not have a placenta, so their offspring must be born much earlier. They complete their development attached to the mother's nipple, sometimes in a pouch. The third group of mammals, monotremes, lay eggs. Platypuses and echidnas are monotremes.

A Varied Group

Scientists have identified 335 marsupial species, including kangaroos, wallabies, possums, wombats, and koalas. Bandicoots, opossums, numbats, gliders, quolls, and cuscuses are also marsupials. Most marsupials live in Australia

Fact File

MARSUPIALS

Families: 20 families (335 species)

Orders: Didelphimorphia (American opossums), Paucituberculata (shrew opossums), Microbiotheria (Monito del monte), Dasyuromorphia (quolls, dunnarts, marsupial mice, and numbats), Notoryctemorphia (marsupial moles), Peramelemorphia (Bandicoots and bilbies), and Diprotodontia (cuscuses, brushtails, pygmy possums, possums, gliders, ringtail possums, gliders, striped possums, kangaroos, wallabies, musky rat kangaroos, koalas, wombats, and honey possums)

Where do they live? Australasia and South and North America, including Central America

Habitat: Varied, including rain forests, grasslands, mountains, and deserts



Size: Varies according to species, from long-tailed planigale (0.16 ounce; 4.5 g) to red kangaroo (200 pounds; 95 kg)

Coat: Extremely varied, according to species

Diet: Varied, including plant food and insects; some marsupials are meat eaters, while others are omnivores

Breeding: Females give birth to 1–25 offspring, according to species

Life span: Varies among species from 1–25 years in the wild

Status: Varies according to species

MARSUPIALS




and on the large island of New Guinea to the north. In Australia, marsupials are the main group of mammals. Some opossums live in South and Central America; one species, the Virginia opossum, lives in North America.

All Shapes and Sizes

Marsupials come in many shapes and sizes. The largest marsupial, the red kangaroo, can weigh 20,000 times as much as the smallest species, the tiny long-tailed planigale. Some marsupials look like mice, with their rounded ears, bright eyes, and long tail. Wombats look more like miniature bears.




DID YOU KNOW?

-  The smallest marsupial, the long-tailed planigale, weighs just 0.16 ounce!
-  Red kangaroos are the largest marsupials on Earth. The males stand up to 78 inches tall!
-  Marsupials make all sorts of noises. Small possums squeak, while koalas make loud bellowing sounds!

A few burrowing marsupials resemble moles. However, many marsupials look like no other mammal. Koalas have a cuddly appearance, with a large head, a black nose, tufty ears, and woolly fur. Kangaroos and wallabies can stand upright on their long, strong back legs, supported by a long, sturdy tail.

Habitats and Movement

Marsupials live in all sorts of habitats, including tropical rain forests, grasslands, mountains, and the dry Australian outback. Possums, koalas, and gliders live in trees. Most kangaroos and wallabies live on the ground. Wombats sleep in underground burrows, while marsupial moles spend their lives underground.

 *The Tasmanian devil is a meat-eating marsupial, with powerful jaws and sharp teeth. Despite its name, this animal is not dangerous to people.*

Marsupials move around in different ways. Possums, opossums, and koalas are expert climbers. Cuscuses have a long, flexible tail, which they curl around branches as they climb. Gliders are named for their habit of launching themselves off high branches and gliding gently downward. Kangaroos hop along the ground on their strong, springy back legs. Marsupial moles use a swimming movement to burrow through the soil.

Types of Food

Marsupials eat all kinds of foods. Most are herbivores, or plant eaters. Various species feed on grass, leaves, tree gum, and nectar and pollen from flowers. Quolls and Tasmanian devils are meat-eating hunters. Some marsupials feed mainly on insects. A few marsupial species are omnivores—they eat both plants and animals.

For example, the Virginia opossum of North America eats fruit, flowers, eggs, and also insects and other small creatures.

Growing in the Pouch

The unusual breeding habits of marsupials set them apart from other mammals. Young placental mammals develop inside the mother's uterus until well formed. In contrast, baby marsupials are born at a very early stage of development. They are extremely underdeveloped and tiny—newborn eastern gray kangaroos weigh less than 0.03 ounce, for example. They are born just thirty-six days after mating. Newborn marsupials are blind and hairless, with stubby, undeveloped limbs.

Immediately after birth, the tiny baby begins an amazing journey from the mother's birth opening to her pouch. The baby clings to her

MARSUPIAL MOLES

Marsupial moles live underground in the central deserts of Australia. With their tiny eyes, silky fur, and barrel-shaped body, they look like ordinary moles. Marsupial moles have large, powerful front limbs that end in long, curving claws. They use these claws to shovel sand aside as they tunnel underground. These unusual marsupials feed on insects and small reptiles, which they find on the surface or below ground.



THREATS AND CONSERVATION

Marsupials face many threats in the wild. Some species have become rare because of hunting. A striped marsupial called the thylacine, or Tasmanian tiger, died out in the 1930s because of hunting. Australian marsupials are also threatened by new



predators brought to their homelands by people, including dingoes, red foxes, and cane toads.

The biggest threat to marsupials is probably habitat loss. The forests where some marsupials live are being cut down for timber, and other wild places are cleared to make space for new farms, roads, and towns. However, parts of these wild habitats are now protected as national parks or preserves.

📍 *The last thylacine to be captured in Tasmania, an island off the southeastern coast of Australia, died in a zoo in 1936.*

fur with its front limbs and claws its way upward. Somehow it knows to head for the pouch on its mother's belly. When it reaches the pouch, it climbs inside and clamps onto the teat, which supplies milk. The teat swells to fill the tiny marsupial's mouth, so the baby cannot drop out as the mother moves around. After one or two months, the baby's mouth grows large enough to let go of the teat, but the youngster stays in the pouch. Feeding on its mother's rich milk, the baby grows quickly

and completes its development. Young eastern gray kangaroos weigh 11 pounds at ten months old, and they leave the pouch for short periods. However, they continue to drink their mother's milk until they are around eighteen months old. They climb back into the pouch to rest or whenever danger threatens.


Some female marsupials, such as South American opossums, do not have a pouch. The mother carries her babies inside two flaps of skin on her belly until they are well grown.

Social Life and Breeding

Marsupials vary in their social habits. Koalas and brushtail possums are among the species that mostly live alone. Each animal has its own home range, in which it lives and feeds. That home range usually overlaps with the ranges of several others. Some gliders and possums live in family groups consisting of a mother, a father, and their offspring. Alternatively, the group may include one male and several females. Large kangaroos live in mixed-sex groups called mobs.

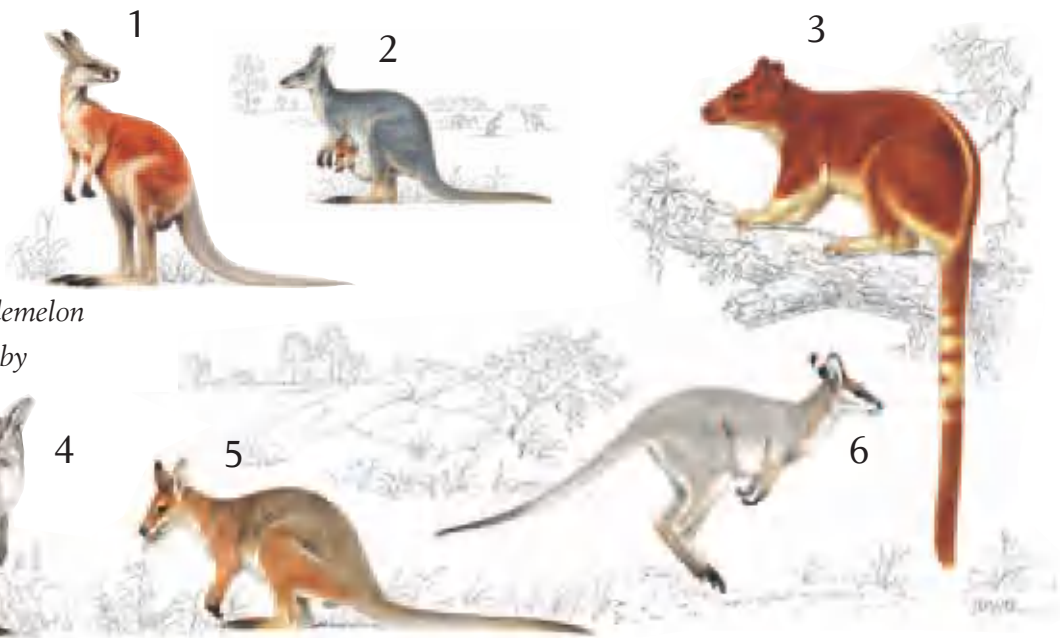
Large marsupials such as kangaroos usually produce just one baby. Small marsupials such as pygmy possums and feathertail gliders give birth to three to four babies at a time, and may breed twice a year. Virginia opossums produce

DID YOU KNOW?

-  Until the sixteenth century, marsupials were unknown outside Australia and the Americas!
-  European experts took three centuries to realize that marsupials were not strange rodents but a completely different group of mammals!
-  Since the 1980s, scientists have discovered several new marsupial species. They include the long-footed potoroo of Australia and two tree kangaroo species from the rain forests of New Guinea.

up to ten offspring, three times a year. Hensel's short-tailed opossum of South America may hold the record for births among marsupials—up to twenty-five babies may be born at a time.

1. Red kangaroo
2. Wallaroo
3. Goodfellow's tree kangaroo
4. Bridled nail-tailed wallaby
5. Red-legged pademelon
6. Whiptail wallaby



MARTEN

Marten spend much of their lives in trees and are skilled climbers. These graceful members of the weasel family are highly efficient killers.





Marten are medium-sized mammals with a compact body, wedge-shaped head, and rounded ears. They have sharp claws and hairy-soled paws that grip firmly to branches. Their bushy tail helps them balance as they leap from tree to tree.

Marten are members of the weasel and skunk family, which includes otters and badgers. The eight species of marten have different markings. Most have dark brown fur, often with a pale bib, or throat patch. One species, the fisher, has no bib; it lives in North America. The marten's fur is soft and silky. Marten such as sables and fishers were once hunted and trapped for their fur.

Meat-eating Forest Loners

Marten live in Europe, Asia, and North America. A closely related species, the tayra, dwells in South and Central America. Most marten live in forests. Sables, European pine marten, and North American marten live in northern conifer forests. Beech marten, also called stone or house marten, live in pine forests, broad-leaved woodlands, rocky areas, and near towns.

Marten feed mainly on small mammals, such as squirrels, but they also eat birds, eggs, insects, and fruit.

Marten live alone, except for females with offspring. Fishers mate in early spring, but most species mate in late summer. The litter of one to five offspring, called kits, are born blind, deaf, and helpless. However, by three to four months they can kill their own prey.

A pine marten balances among the branches of a conifer. Marten are expert hunters that can easily chase and capture squirrels high in the treetops.

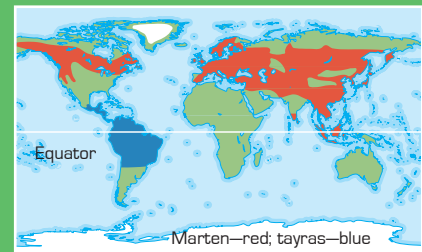
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MARTEN

Family: Mustelidae; subfamily Mustelinae
(8 species)

Order: Carnivora

Where do they live? North America, Europe, and Asia



Habitat: Coniferous and broad-leaved forests; stone marten near towns

Size: Head-body length 12–45 inches (30–75 cm); weight 1–13 pounds (0.5–6 kg)



Coat: Soft, thick, brown fur, often with pale throat patch, or bib

Diet: Small mammals, birds, fish, insects, and fruit

Breeding: Females give birth to 1–5 offspring, after 8–9 months' gestation

Life span: 10–15 years in the wild

Status: Nilgiri marten is listed as vulnerable

MOLES AND DESMANS

Moles and desmans are a varied group of mammals. Moles spend their lives underground, while desmans are strong swimmers that find their food in water.





Moles live in many parts of Europe, Asia, and North America. There are forty species. Desmans are much rarer—there are only two species. One lives in southwestern Russia and eastern Europe, the other in the Pyrenees mountains between France and Spain.

Moles and desmans have a long, cylindrical body covered with dense, sleek fur. The slender snout is hairless but has long, sensitive whiskers. The small eyes are often hidden by fur. Moles and desmans rely on their sense of touch to move around and find food. They have touch-sensitive hairs on many parts of the body, including the tail. The mole's body is suited to its burrowing lifestyle. The large, powerful, clawed front feet dig through the soil and push it aside. A desman's body is suited to swimming, with waterproof fur and a long, flat tail that acts as a rudder. Its feet are webbed, and its powerful hind legs act as flippers.

Feeding and Life Cycle

Moles feed on earthworms, slugs, and soil-dwelling insects. Desmans hunt in water, feeding on water-dwelling insects, freshwater shrimps, and snails. Russian desmans also eat larger prey, such as fish and frogs.

Moles are mainly solitary. Russian desmans may be more social—up to eight have been found living in one burrow. Moles produce two to seven offspring, which feed on their mother's milk for four or five weeks. Russian desmans produce three to five youngsters.

A European mole tunnels to the surface, using its huge front feet to dig through the soil. Its pointed snout is covered with long, sensitive whiskers.

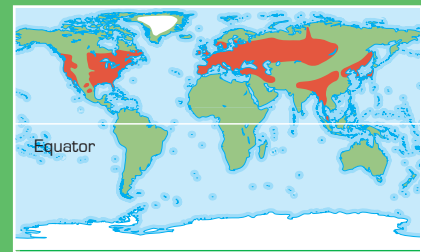
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MOLES AND DESMANS

Family: Talpidae [42 species]

Order: Eulipotyphla

Where do they live? North America, Europe, and Asia



Habitat: Mole—underground in forests and grasslands; desmans—by rivers and lakes

Size: Head-body length 1–8.5 inches (2.4–21.5 cm); weight 0.4–19.5 ounces (12–550 g)



Coat: Mole—short, brownish black or gray fur; desman—waterproof fur, brown on upper body, gray below

Diet: Mole—earthworms, insect larvae, and slugs; desman—aquatic insects, shrimps, snails, and fish

Breeding: Mole—2–7 offspring after 30–42 days' gestation; desman—3–5 offspring after 15 days' gestation

Life span: Mole—4–5 years

Status: Small-toothed mole and Pere David's mole are critically endangered; four further mole species are endangered; both species of desmans are vulnerable



MONGOOSES

Mongoose are agile, meat-eating mammals of Africa and southern Asia. Some mongooses are famous for their skill in tackling poisonous scorpions and snakes.





Mongoose are fast-moving, nimble animals. Their long, slender shape allows them to chase prey such as scorpions, insects, and mice down their burrows. Mongooses have small, rounded ears, short legs, and a long, bushy tail. They live in Africa, apart from the Sahara desert, and from the Middle East to Southeast Asia. Mongooses also live in southern Spain.

Mongooses dwell in forests, woodlands, marshes, dry grasslands, and deserts. Most live on the ground, but they are also skilled tree climbers and swim well. In African grasslands, some species live in termite mounds.

Adaptable Hunters

Mongooses are meat eaters. They feed on whatever they find, including rats, mice, snakes, lizards, insects, and scorpions. Marsh mongooses feed on fish, crabs, and mussels, while other mongooses eat fruit or birds' eggs. The Indian mongoose kills poisonous snakes, such as cobras. Mongooses are so skilled at hunting that some people have introduced them to new areas to control rats, snakes, and other pests.

Most mongooses live alone, except when breeding. However, a few species, such as meerkats and common dwarf mongooses, live in groups of up to thirty animals. These social species are small and live in dry grasslands, where they feed on insects. Group life provides safety in numbers. While the group feeds, one meerkat acts as a sentry, rearing up on its hind legs to watch for danger.

A meerkat sentry watches for predators, such as hawks and jackals. If it spots danger, it gives a loud alarm call, and the meerkats dive for safety.

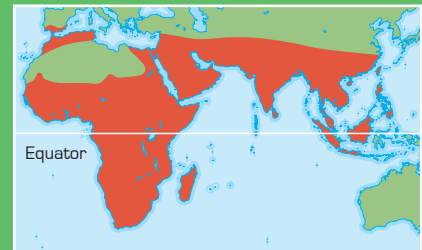
Fact File

MONGOOSES

Family: Herpestidae (33 species)

Order: Carnivora

Where do they live? Africa, Arabia, South and Southeast Asia, and southwestern Europe



Habitat: Varied, including forests, woodlands, dry grasslands, and deserts

Size: Head-body length 9.5–23 inches (24–58 cm); weight: 11 ounces–11 pounds (320 g–5 kg)



Coat: Long, coarse fur, gray to brown or yellowish; some have bands or stripes

Diet: Small mammals, reptiles, birds' eggs, fish, crabs, insects, and fruit

Breeding: Females give birth to 1–6 offspring after 42–60 days' gestation

Life span: Up to 10 years in the wild, and 19 years in zoos

Status: Most mongooses are not threatened



MONOTREMES

Monotremes are a small group of extremely unusual mammals that live in Australia and on the large island of New Guinea to the north. Unlike all other mammals, monotremes reproduce by laying eggs.

There are just five species of monotremes—the duck-billed platypus and four types of echidnas. Monotremes breed by laying leathery shelled eggs that hatch after around ten days. In this respect, monotremes are like reptiles, which also breed by laying eggs. However, monotremes

📍 *Echidnas (below left) and duck-billed platypuses (below right) are monotremes that lay eggs.*



are unmistakably mammals. They have a furry body and are warm-blooded—their body temperature stays the same whatever their surroundings. Like other mammals, female monotremes feed their offspring on milk.

Echidnas

Echidnas, also called spiny anteaters, are covered with sharp spines. They have a thin, pointed snout with no teeth, and large clawed feet. The short-beaked echidna lives in Australia, Tasmania, and New Guinea. It feeds on ants and termites, which it slurps up with its long, sticky tongue. The three species of long-beaked echidnas live in the mountains of New Guinea. They eat earthworms, which they grind into pieces using horny spines in their mouth.

Echidnas defend themselves against enemies by rolling into a prickly ball or burrowing into the soil, leaving just their spines showing. In New Guinea, echidnas hibernate in winter.

The female echidna lays her eggs and scoops them into a pouch on her abdomen. When the offspring hatch after ten days, they lap up the milk that seeps from patches in the pouch.

Duck-billed Platypus

The duck-billed platypus has a ducklike beak, a molelike body, and webbed feet. It lives by streams and rivers in eastern Australia. The platypus hunts food underwater, finding prey with its touch-sensitive bill. The male has poisonous spurs on his hind legs, with which he threatens other males in the breeding season.

Female platypuses have no pouch. They lay their eggs in a grass-lined burrow by the river.

Fact File

MONOTREMES

Families: Tachyglossidae (4 species of echidnas) and Ornithorhynchidae (duck-billed platypus)

Order: Monotremata

Where do they live? Australia, including Tasmania, and New Guinea



Duck-billed platypus



Echidna

Habitat: Echidna—varied, including forests, grasslands, and mountains; platypus—by rivers and streams

Size: Echidna—head-body length 12–35 inches (30–90 cm); weight 5.5–22 pounds (2.5–10 kg). Platypus—head-body length of male 17.7–23.6 inches (45–60 cm), bill 2.3 inches (5.8 cm); weight of male 2.2–5.3 pounds (1–2.4 kg)

Coat: Echidna—black or brown, spines on back and sides; platypus—soft, dark-brown fur

Diet: Echidna—ants, termites, and earthworms; platypus—water-dwelling insects and shrimps

Breeding: Females lay 1–3 eggs that hatch after around 10 days

Life span: Echidna—not known in wild, but up to 49 years in zoos; platypus—10 years in the wild, and up to 17 years in zoos

Status: Short-beaked echidna and platypus are lower risk; western long-beaked echidna is endangered

NEW WORLD MONKEYS

New World monkeys are agile, forest-dwelling monkeys that live in Central and South America. They include some of the world's brainiest mammals, and the only monkeys that are active at night.





The New World is made up of North America, Central America, and South America. Monkeys do not live in the United States but they do live in Mexico and much of northern South America. New World monkeys have a flatter face and more widely spaced nostrils than Old World Monkeys, which live in Africa and Asia. Some New World monkeys have a nimble, prehensile (grasping) tail. There are ninety-one species of New World monkeys. They include small, agile squirrel monkeys, capuchins, and night monkeys, which scamper through the branches by moonlight. Howler monkeys are famous for their loud calls. Spider monkeys have long, spindly limbs that make them resemble spiders. The group also includes titis, woolly monkeys, and uakaris, which have a hairless, red face.

From Little to Large

New World monkeys vary from light, nimble squirrel monkeys that measure just 10 inches long from head to rump, to woolly spider monkeys that measure 25 inches long. In many species, males are larger than females. New World monkeys vary in color from white and yellow to red, brown, and black. In a few species, males and females are different colors. Some species have a tail up to 29 inches long, while uakaris have a short tail.

New World monkeys live mostly in moist, tropical forests that stay green all year round. Many species

A female white-faced saki watches from a treetop. These New World monkeys eat mainly fruit but also seeds and some leaves. The males have a white face.

Fact File

NEW WORLD MONKEYS

Families: Cebidae (16 species of capuchins and squirrel monkeys), Aotidae (10 species of night monkeys), Atelidae (25 species of spider, woolly, and howler monkeys, and muriquis), and Pitheciidae (40 species of sakis, titis, and uakaris)

Order: Primates

Where do they live? Mexico south through northern South America



Habitat: Tropical and subtropical forests, from sea level to 3,280 feet (1,000 m)

Size: Head-body length 10–25 inches (25–63 cm); weight 1.3 pounds–26 pounds (0.6 kg–12 kg)



Coat: Varies from white to yellow, red, brown, or black; some species have markings, mostly on the head

Diet: Plant food, including fruit, nuts, seeds, and leaves; also insects and occasionally small mammals

Breeding: 1–2 offspring, born after 120–225 days' gestation

Life span: 12–25 years, depending on species

Status: Around one-third of species are scarce or in danger of dying out



NEW WORLD MONKEYS

🔍 A group of squirrel monkeys enjoys a grooming session. These activities help strengthen the bonds among group members.

Some species dwell in the Amazon rain forest in South America—the world’s largest rain forest. Some species live high on mountains, while others dwell in lowlands or near the seashore. Uakaris live in flooded swamp forests on the banks of rivers, such as the Amazon. Some monkeys live over a huge area, while the Coiba Island howler monkey lives on just one small island off the coast of Panama.



MONKEY GROOMING

New World monkeys make close links with others in their group by grooming—cleaning one another’s fur. One monkey approaches another and lies down on a branch to invite a grooming session. The groomer combs through the other monkey’s fur, concentrating on hard-to-reach places. This monkey works for a few minutes and then turns around to be groomed itself.

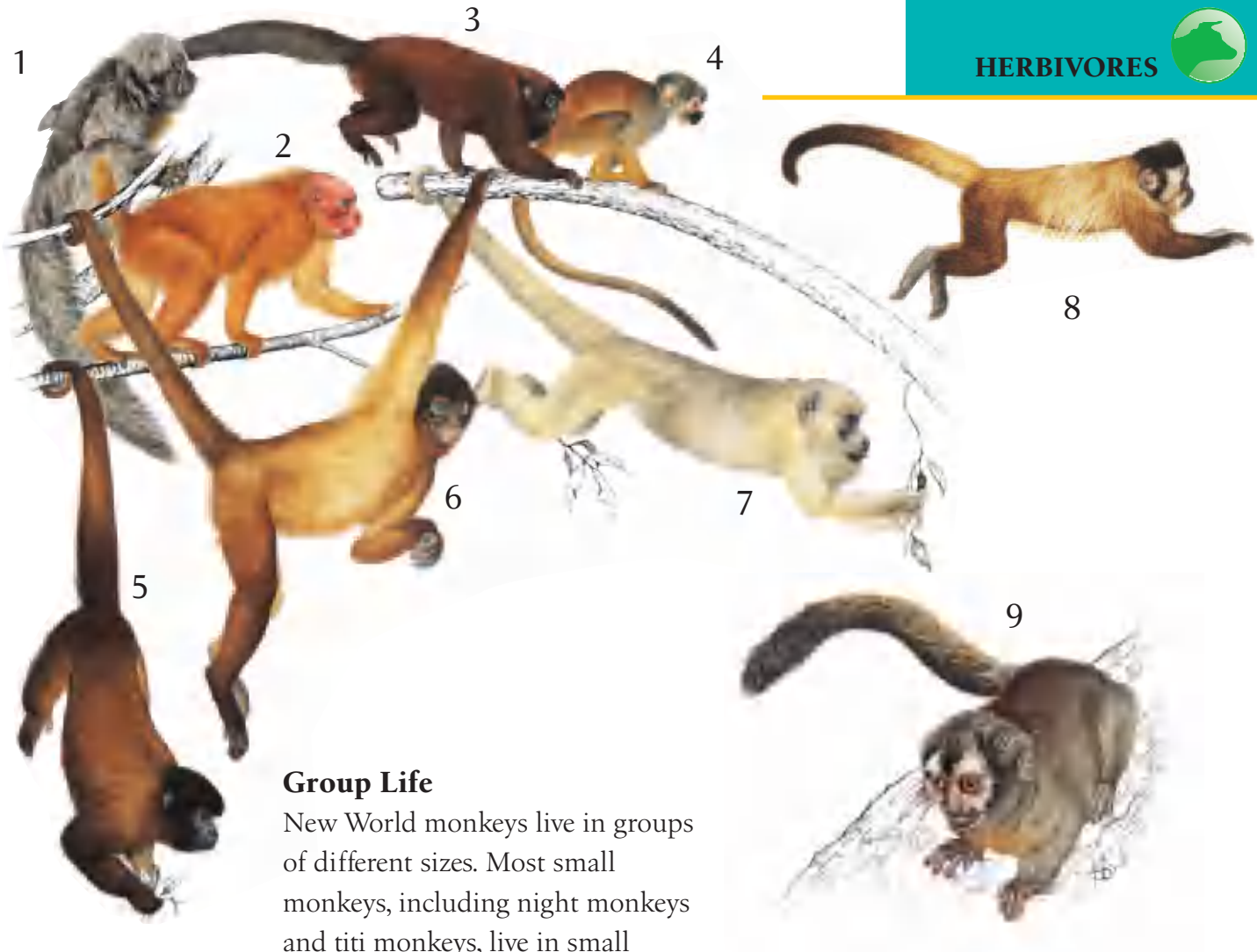
New World monkeys spend most of their life in the trees. Some species climb down to the ground to play, look for food, or travel between patches of forest.

All New World monkeys are skilled climbers, but they move about the forest in different ways. Squirrel monkeys leap through the treetops, like squirrels. Spider monkeys hang from branches by their long arms and swing from paw to paw. Large species, such as howler monkeys, clamber about more slowly. Some species have a long, flexible, prehensile tail that acts as a fifth limb for gripping branches.

Types of Feeding

New World monkeys are mostly plant eaters, feeding on fruit, leaves, flowers, nuts, and seeds. Some species catch insects or even small mammals to vary their diet.

Monkeys that eat mainly leaves, such as howler monkeys, have broad teeth and a long digestive system to help break down their tough, stringy food. Capuchins eat hard seeds, which they crack open by banging them together. Squirrel monkeys have sharp, narrow teeth with which they crunch insects.



Group Life

New World monkeys live in groups of different sizes. Most small monkeys, including night monkeys and titi monkeys, live in small family units made up of a father, a mother, and their offspring from different years. Large species live in groups of at least five monkeys.

Howler monkeys and capuchins live in groups called harems, made up of one male and several females.

Squirrel monkeys live in large groups of thirty to forty animals. The group is made up of several adult males, up to twelve females, and their offspring. Living in a large group has several advantages. While

1. *White-faced saki*
2. *Bald uakari*
3. *Red-bellied titi*
4. *Squirrel monkey*
5. *Smokey woolly monkey*
6. *Geoffroy's spider monkey*
7. *Black howler monkey*
8. *Brown capuchin*
9. *Northern night monkey*

DID YOU KNOW?



Geoffroy's spider monkey can pick up small items of food with its delicate tail!



Some New World monkeys have a prehensile (grasping) tail with a hairless tip, which provides an extra-good grip on branches.



In some species of new World monkeys, most females have color vision, while the males are always color-blind.

NEW WORLD MONKEYS

the monkeys feed, many eyes and ears are alert for danger, such as an approaching hawk or eagle. Group members also share discoveries of good food sources, such as a tree heavy with ripe fruit.

Each monkey group has a home range or patch of forest in which it feeds. Some monkeys defend this territory against rival groups. They make warning calls or shake the branches in a fierce display. Howler monkeys and titi monkeys make loud whooping cries at dawn to warn away rival groups. However, groups of black-capped squirrel monkeys are content to share the same feeding tree.

A few types of New World monkeys form mixed groups made up of two different species. Spider monkeys and capuchins team up in this way. Squirrel monkeys team up with either capuchins or uakaris.

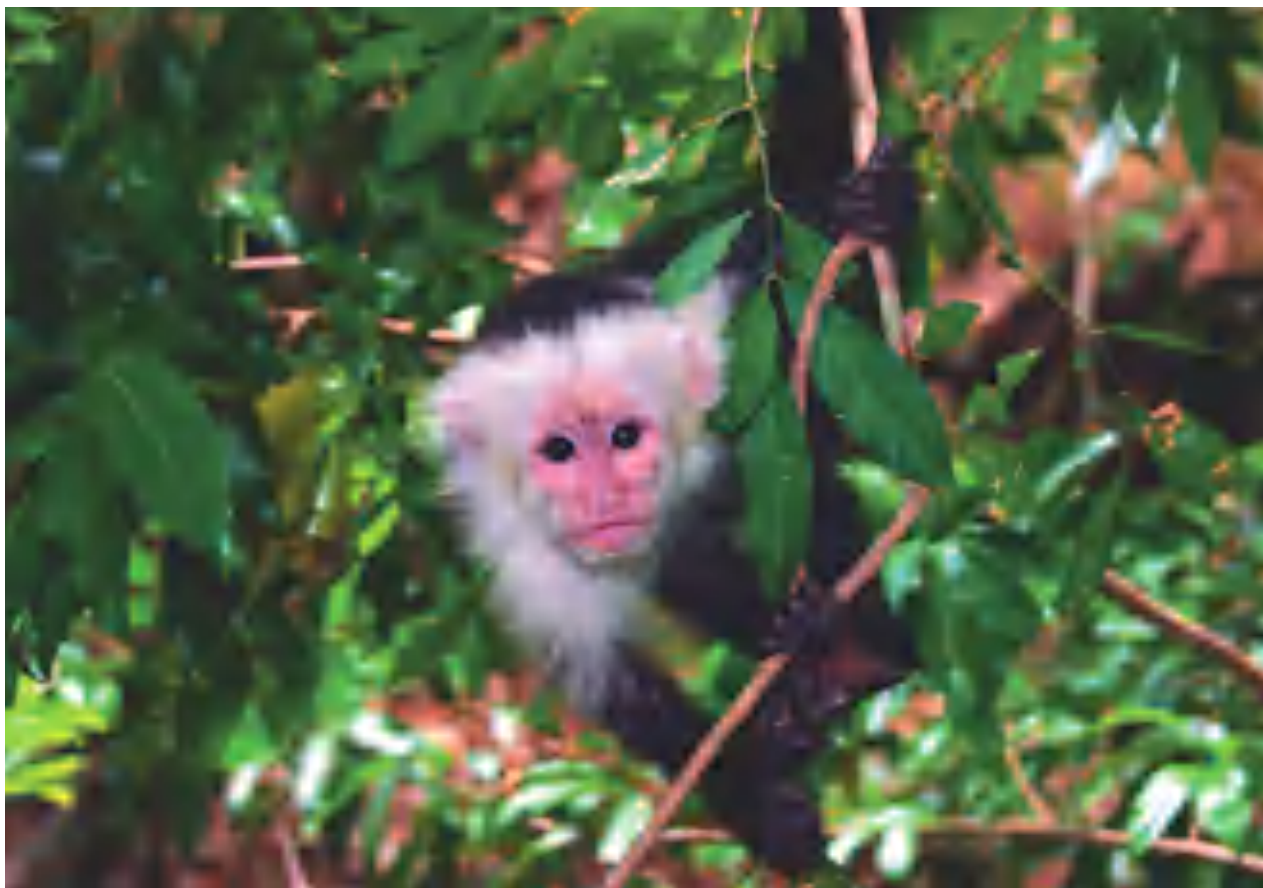
Breeding and Conservation

New World monkeys breed slowly. The females usually produce just one baby, occasionally twins, between four and seven-and-a-half months after mating. The young animals spend a lot of time playing. They play-fight and explore their leafy world. As the mother moves through the treetops, the baby monkey rides on her back or clings to her fur.






NIGHT MONKEYS


Night monkeys of South America are the only monkeys that are strictly nocturnal—they are active only at night. With their large eyes, night monkeys see well in the darkness. They feed on leaves, fruit, and insects. They can see to catch insects even in dim light. On moonlit nights, they make spectacular leaps through the branches, sometimes covering 10 to 16 feet in a single bound. Night monkeys live in small groups of up to five animals.



Nearly one-third of all New World monkeys are rare, and some are in danger of dying out altogether. The main threat is habitat loss because the forests in which the monkeys live are cut down for timber or to clear the land for farming. In some parts of the Amazon, up to 100,000 acres are cut down every day. In the Amazon rain forest, local people also hunt spider monkeys and woolly monkeys for meat.

DID YOU KNOW?

-  Some New World monkeys use various plants as medicines to treat skin or digestive problems. Some monkeys also use plants to keep insects away!
-  Groups of brown capuchin monkeys spread out to search for food. If one monkey discovers a good supply of fruit, it gives a loud whistle to call the others!
-  Some leaf-eating monkeys eat soil, which contains minerals that help them digest the poison present in their leafy food!

 *High in the rain forest canopy, a white-faced capuchin grips the branches with its hands and feet.*

ORANGUTANS

The steamy rain forests of Southeast Asia are home to large, hairy apes called orangutans. Orangutans are among the most intelligent of all mammals, but they are now extremely rare.





Orangutans live in the rain forests of Southeast Asia. There are two species—one lives on the large island of Borneo, which is part of Indonesia, and the other on neighboring Sumatra. The word *orangutan* means “forest person” in a local language. Orangutans are covered with long, shaggy orange-red hair. Their arms are much longer than their legs. They use their long arms to move through the forest. The ape grasps the branches with its long, hooklike hands and swings from arm to arm. This method of movement is called brachiation.

Orangutans grow up to 54 inches tall. Males can be twice the size of females. An adult male is an impressive sight, with large cheek pouches and a mane of long hair on his shoulders. He also has a large throat pouch, which he uses to make loud, booming calls.

Fruit Feeders in the Trees

Orangutans spend their life in the trees and rarely come down to the ground. They are active during the day, when they look for food. Twice a day, they make a sleeping platform in a tree by breaking and folding branches and placing branches and twigs on top. One nest is used for a brief daytime nap, and a more sturdy nest is made for nighttime. If it is raining, the ape adds an extra layer of branches to make a watertight roof.

Orangutans have large appetites. They are mainly plant eaters. They feed mostly on many kinds of

A male orangutan has extremely shaggy fur, a bare black face, and large cheek pads of fatty tissue. Fully grown, a male can reach up to 54 inches tall.

Fact File

ORANGUTANS

***Pongo pygmaeus* (Bornean orangutan) and *Pongo abelii* (Sumatran orangutan)**

Family: Hominidae

Order: Primates

Where do they live?

Borneo and northern Sumatra (Southeast Asia)



Habitat: Tropical rain forests

Size: Head-body length 31–38 inches (78–97 cm); weight: 88–200 pounds (40–90 kg)



Coat: Long, shaggy, orange-red hair; bare black face; pinkish muzzle

Diet: Fruit, shoots, vines, bark, seeds, insects, birds' eggs, and occasionally small mammals

Breeding: 1 offspring born after 235–270 days' gestation

Life span: Up to 35 years in the wild, and up to 60 years in zoos

Status: Critically endangered (Bornean orangutan); endangered (Sumatran orangutan)



ORANGUTANS

fruit, including figs and mangoes. They also eat young leaves, vines, bark, insects, birds' eggs, and sometimes small mammals.

Orangutans have a strong jaw, with broad teeth to grind hard seeds and rip off tree bark.




Orangutans mostly live in valleys and lowland forests because food is more plentiful there. They spend their days moving slowly through the forest, stopping to feed at ripe fruit trees. They usually cover less than

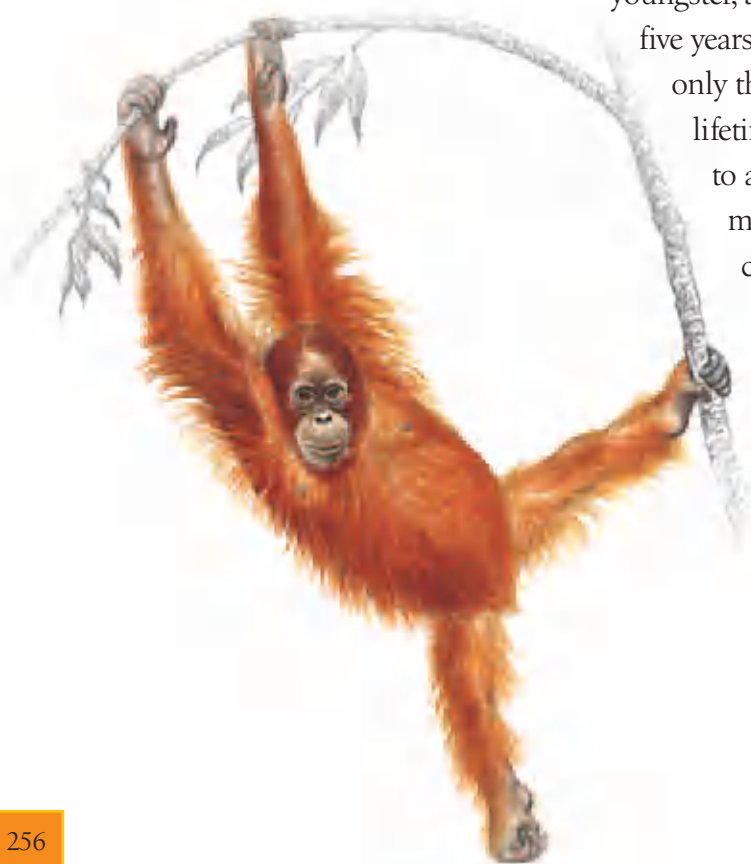
half a mile in a day. Each orangutan has a home range—the total area in which it lives and feeds. These apes do not mind other orangutans using the same area. Bornean orangutans are loners, except for females and their offspring. Sumatran orangutans are more sociable, traveling around in groups.


Slow-breeding Apes

Orangutans are slow breeders. The females do not usually give birth until around the age of fifteen years. They take up to six years to rear each youngster, and live to around thirty-five years. So, a female will have only three or four babies in her lifetime. The female gives birth to a single baby eight to nine months after mating. She carries her baby continuously for the first year. The youngster feeds on its mother's milk until the age of three and remains with her

DID YOU KNOW?

-  An orangutan's arms can grow to 6.6 feet long!
-  The loud call of the male orangutan echoes more than a mile through the forests!
-  Orangutans get moisture from juicy fruit. They also drink from rain-filled tree holes, streams, and pools.



 *A female Sumatran orangutan grasps a branch with its hooklike hands.*



USING TOOLS

Orangutans are among the world's brainiest primates. Primates are members of the order (large group) Primates, which includes humans, apes, monkeys, and lemurs. Sumatran orangutans use stick tools to take honey from bees' nests. They also use twigs to fish ants and termites from their nests. Young orangutans learn these skills by copying the adults. Scientists think that the use of tools by animals is a sign of intelligence.




for seven to ten years. The baby orangutan learns many things from its mother, including how to find more than 400 different types of food and how to find its way through the forest. Sumatran orangutans also learn to use tools (see the box above).

Threats and Conservation

A few centuries ago, orangutans were widespread in Southeast Asia. Now they are rare and in danger of extinction. Hunting and habitat loss are to blame. Local people kill orangutans for food. Many years ago,

orangutans were also captured for zoos and for sale as pets. Now, forest destruction is the biggest danger to these apes. The forests where the orangutans live are being cut down for timber at an increasing rate. In the last few years, fires have also damaged large areas of rain forest.

The main hope for saving these intelligent creatures is to set up preserves and national parks to protect orangutans from loggers and hunters. Preserves have now been set up on Sumatra and Borneo in an attempt to increase the numbers of these endangered animals.

 *Using its hands and feet, this young orangutan swings effortlessly from the trees. An orangutan's fingers are nimble enough to use sticks as tools to get food.*

OTTERS

Members of the weasel family, otters are thoroughly at home in water. Otters live and hunt by rivers, lakes, or the ocean. Sea otters spend almost all of their life in the ocean.





An otter's body is suited to life in water. Most otters have webbed feet, with skin between the toes. Webbed feet act as paddles, pushing against the water. Some otters have a broad, flat tail, like a beaver's tail. Otters have a long, slender body. This streamlined shape slips easily through the water, which enables fast swimming. Otter fur is made up of two layers—a layer of long, coarse outer hairs called guard hairs, and a layer of dense, fine underfur. This arrangement keeps the mammal warm in cold water.

Feeding on Fish

Otters are meat eaters and belong to an order (large group) of mainly meat-eating mammals called Carnivora. This order includes cats, dogs, and bears. Otters eat mainly fish, but many species also catch frogs, crabs, clams, and crayfish. Some otters also hunt birds and small mammals. Otters mostly take slow-moving fish, such as eels. When hunting in water, otters use the sensitive whiskers on their snout to help find their prey. African and Asian clawless otters feel for crabs underwater with their long fingers. Otters use their nimble forepaws to hold food and prise open shells.

Keeping warm in cold water uses a great deal of energy. Otters eat large amounts of food to provide this energy. Most otters spend three to five hours a day fishing. Mothers with hungry cubs spend around eight hours a day hunting. European otters need to

This otter clearly shows the short, dense fur that keeps the animal warm in its watery habitat. Otters were once hunted for their thick, soft fur.

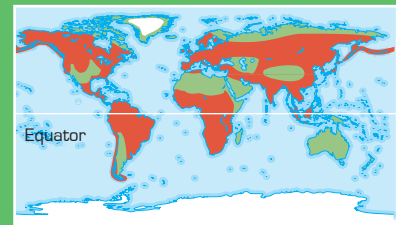
Fact File

OTTERS

Family: Mustelidae; subfamily Lutrinae
(13 species)

Order: Carnivora

Where do they live? Widespread outside polar regions; not Australia or Madagascar



Habitat: By and in rivers and streams; also coastal waters

Size: Head-tail length 2.2–5.9 feet (66–180 cm); weight 11–88 pounds (5–45 kg)



Coat: Brown; darker above, with paler underparts

Diet: Mainly fish; also frogs, crabs, and crayfish; sometimes birds and small mammals

Breeding: 1–4 cubs, usually born after 60–70 days' gestation, but sometimes 12 months

Life span: Up to 20 years

Status: Some species are vulnerable or endangered



OTTERS




eat around 15 percent of their body weight every day to maintain a warm body temperature. North Pacific sea otters have to eat even more, around 20 to 25 percent of their body weight, to keep warm.

The Otter Family

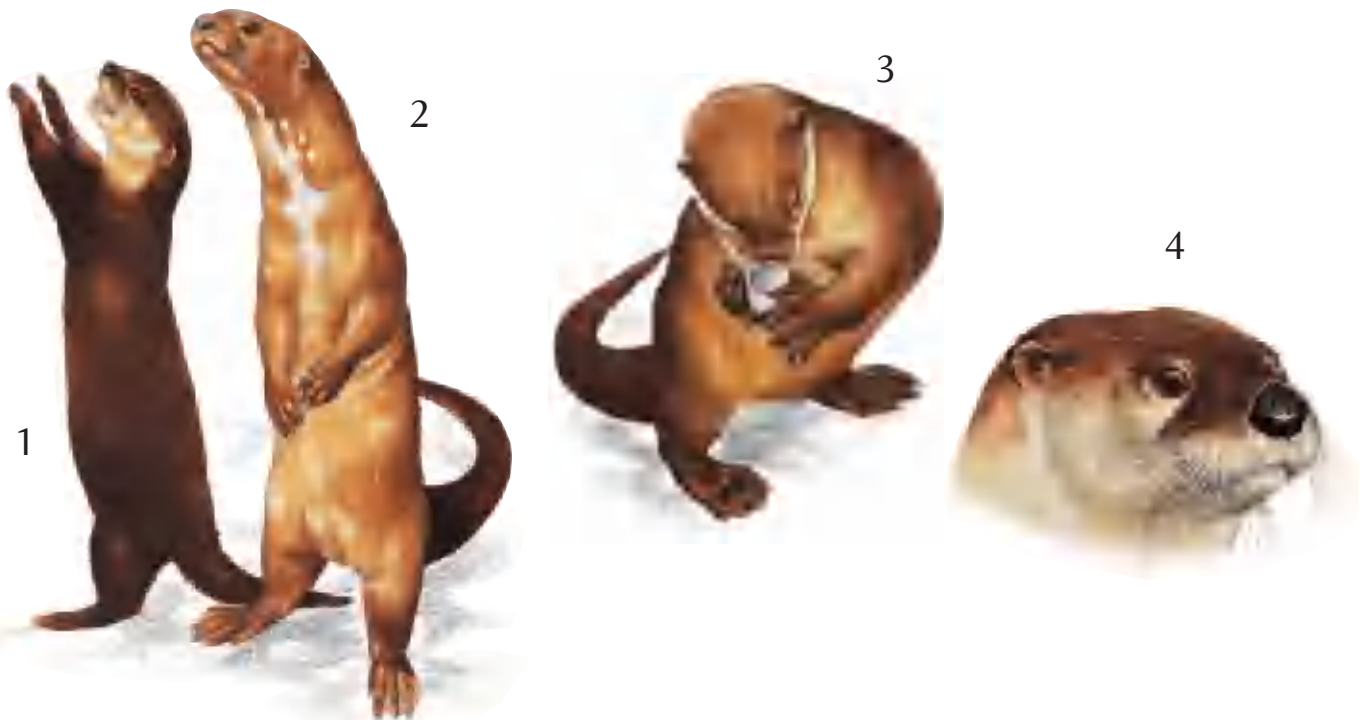
Otters are mustelids, members of the weasel and marten family, which also contains badgers. Otters are a widespread group of mammals and live in many parts of Europe, Africa, Asia, and the Americas. Otters do not live in Australia. There are thirteen species of otters. Most areas contain only one species of otter.

Many otters live by freshwater rivers and streams, but some species live

DID YOU KNOW?

-  The largest otter, the giant otter of South America, measures up to 5.9 feet from snout to tail tip!
-  Short-clawed otters of southern Asia are the smallest otters. Adults measure as little as 26 inches from nose to tail tip.
-  Otters have small, rounded ears, which close to keep out the water when they dive.

and hunt in saltwater. Two American species spend almost their whole life in the ocean. The marine otter lives off the west coast of South America, while the sea otter dwells in the North Pacific, from California north to arctic waters.





Social Life and Scent Marking

Otters vary in their social habits. European otters are mostly solitary, but several females may live close together when they have offspring. In usually solitary species such as this, each otter has its own patch, or home range, in which it hunts. Each otter defends its patch against others of its kind. Male otters have a larger range than females. Otters mark their territory by leaving urine, droppings (called spraint), and by smearing scent from glands at the tail base.

Some types of otters are more social than European otters. Male North American otters live in groups of around twelve animals. North Pacific sea otters gather in large

groups called rafts, made up of hundreds of otters. Group life probably helps keep otters safe from predators, such as sharks and killer whales. After mating, female sea otters form a separate group in which they rear their young.

▼ *This sea otter has broken open a mussel shell, using the rock balanced on its chest as an anvil.*



TOOL-USING SEA OTTER

The sea otter of the North Pacific is one of the few mammals that uses tools when hunting. When the otter dives down to hunt clams, it uses a flat stone to dislodge shellfish clinging to rocks underwater. The otter then brings the food to the surface to eat. It places the flat stone on its chest and uses it as a makeshift anvil. The sea otter smashes the clam against the stone to break it open and reach the flesh inside. The use of tools is generally taken as a sign of intelligence among animals.

1 A short-clawed otter reaches out with its forelimbs to take food.

2 The spot-necked otter stretches for food using its neck and body.

3 A smooth-coated otter uses its webbed forepaws to hold a shell to its mouth.

4 Like all otters, the North American river otter has a flat, streamlined skull.

5 A sea otter cracks open a shell on a stone held on its chest.





CHANGING FORTUNES

The North Pacific sea otter has suffered mixed fortunes at the hands of humans. In the late nineteenth and early twentieth century, this otter was hunted for its fur, and its numbers dropped steeply. Only around 1,500 sea otters were left by 1911, when otter hunting was banned. Following the ban, sea otter numbers increased to around 150,000 by the 1980s. However, in 1989, spilled oil from the tanker *Exxon Valdez*, which was wrecked off the coast of Alaska, polluted the North Pacific and killed at least 5,000 sea otters.

🕒 *This sea otter has wrapped seaweed around itself while it rests on its back to prevent it from floating off in the sea.*

Breeding and Rearing Cubs

North American river otters breed in spring, but many otters breed at any time of year. Female otters give birth to one to four cubs, around sixty to seventy days after mating.

In European otters, males and females come together only to mate, and the male plays no further part in rearing the babies.

Sea otter mothers usually carry their young pups on their chest, where they carefully nurse them.

The female otter teaches her offspring to hunt by releasing live fish for them to catch. Even with all this practice, the cubs take eighteen months to perfect their fishing skills.

Otters are known for their playfulness. Cubs are often seen sliding down muddy river banks into the water or tunneling through snowdrifts, apparently for fun.

The cubs also play-fight and chase along riverbanks and in the water. Adult otters can also be playful. Scientists think that this behavior may help strengthen the bonds among group-living otters.



Threats and Environment

Many species of otters were once hunted for their soft fur, which was used to make warm clothing. European otters were hunted so much that they died out in some parts of western Europe. By the mid-twentieth century, these otters were no longer hunted, but they were dying because of pollution. Poisonous chemicals used in farming were draining into rivers and streams and killing the otters. By the 1990s, these harmful chemicals were banned. Numbers of European otters started to rise again.

However, in other parts of the world, otters are still threatened by hunting and pollution. Growing towns and villages expand into the wild places where these otters live.

DID YOU KNOW?



Most otters hunt food on their own, but giant, North American, and smooth-coated otters sometimes hunt in groups.



Sea otters bathe regularly in freshwater, which helps keep their coat waterproof.



Otters make a variety of sounds, including aggressive snarls, friendly whistles, and huffing alarm noises.

Sea otters are social. They live in groups, which probably help keep them safe from predators.



PANGOLINS

Pangolins are armor-plated mammals. Their body is covered with tough, overlapping scales that protect it from enemies. They feed on ants and termites, which the pangolins slurp up with their long, sticky tongue.





Pangolins have a small head, a long body, and a stout tail. Each short, powerful leg ends in five toes with long, curving claws. Pangolins have horny, overlapping scales over the head, upper body, and tail, but the underside is scaleless. This armor-plating protects the pangolin from predators. When threatened, some pangolins roll into a tight ball.

Toothless Insect Eaters

Pangolins have no teeth. The animal's long snout holds a long, sticky tongue, which the pangolin uses to scoop up ants and termites. The pangolin breaks open the ants' nests with its powerful claws and sucks up the insects. The giant pangolin, the largest species, can eat up to 200,000 ants in a single night.

The seven species of pangolins live in Africa and southern Asia in various habitats, ranging from lush rain forests to thorn forests and tropical grasslands, or savannas. Many pangolins live in trees. Their long claws and flexible, prehensile (grasping) tail allow them to climb with ease. They search out the hanging nests of tree-dwelling insects. Two species of African pangolins live on the ground. They sleep in the burrows of other animals and hunt ground-dwelling ants and termites.

Pangolins normally live alone. Females give birth to one or two babies, around two to four months after mating. The mother carries her baby for the first few months, with the baby clinging to her tail.

Ground-living pangolins such as this are sometimes hunted in Africa and Asia for meat and also for their scales, which are used to make traditional medicines.

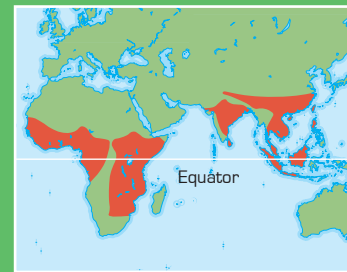
Fact File

PANGOLINS

Family: Manidae (7 species)

Order: Pholidota

Where do they live? Africa south of the Sahara desert, southern and Southeast Asia



Habitat: From forests to tropical grasslands

Size: Head-body length 12–33 inches (30–85 cm); weight 2.6–73 pounds (1.2–33 kg)



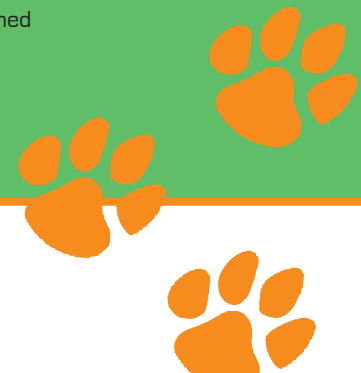
Coat: Horny, overlapping scales on upper body; yellowish to dark brown

Diet: Ants and termites

Breeding: 1–2 offspring, born after 65–139 days' gestation; mature at 2 years

Life span: At least 13 years in zoos

Status: Cape, Indian, Chinese, and Malayan pangolins are lower risk, near threatened



PECCARIES

Peccaries are hoofed mammals that look like furry pigs. With their keen senses of smell and hearing, peccaries search out all sorts of food.





With their long snout, stout body, and neat, hoofed feet, peccaries look similar to pigs. Peccaries live in the Americas, while wild pigs live in Europe, Africa, and Asia. Peccaries dwell in forests, woods, scrublands, and grasslands. There are three species: the collared peccary; the white-lipped peccary; and the Chacoan peccary, which is the largest.

Omnivorous Eaters

Peccaries are omnivores—they feed on both plant and animal foods. Plant foods include fruit, seeds, roots, vines, and cactus stems. Peccaries use their keen nose to snuff out roots and bulbs underground. They also eat insects and other small creatures, including mammals and carrion (the flesh of dead animals).

Peccaries are social animals and live in herds. Chacoan peccaries live in small groups of two to ten adults and offspring. White-lipped peccary herds usually contain fifty to one hundred animals. Each herd has a territory called a home range where the animals find food. White-lipped peccaries have the largest home range, up to 42 square miles. Each herd follows an experienced leader.

In the wild, the main enemies of peccaries are jaguars and mountain lions. If the group senses a predator approaching, one or two older animals stay behind to face the attacker, while the rest escape. If a predator gets close without being noticed, the group scatter in all directions, making loud warning cries.

A female peccary looks after her two offspring. Peccaries are hunted for their meat and hides, but the biggest threat is habitat loss as forests are cleared.

Fact File

PECCARIES

Family: Tayassuidae (3 species)

Order: Artiodactyla

Where do they live? Southwestern United States, Central America, and northern Argentina in South America



Habitat: Tropical forests, woodlands, thorn scrublands, and grasslands

Size: Head-body length 31–53 inches (78–135 cm); weight 35–95 pounds (16–43 kg)



Coat: Adults are gray, brown, or black; young are reddish; some species have white collars

Diet: Varied, including fruit, roots, seeds, stems, insects, small mammals, and carrion (dead animals)

Breeding: 1–4 offspring born after 145–158 days' gestation

Life span: 9–16 years in the wild, and up to 24 years in zoos

Status: Chacoan peccary is endangered

PIKAS

Small and compact, pikas are mammals with long, silky fur that live in mountains and other rugged places. These lively little animals survive long, harsh winters by storing plant food gathered in the fall.





Pikas are members of the hare and rabbit order (large group) Lagomorpha. Instead of a rabbit's long ears, pikas have large, rounded ears. Pikas also have short legs and a stumpy tail. They are around the size of a rat but are rounded and have fine, silky fur. When pikas sit hunched on a rock or in a grassy meadow, they look like fluffy balls.

Harsh Habitats and Stores of Hay

Pikas live in remote, rugged country in North America, the Middle East, and Asia. They live on mountains, to heights of 20,000 feet, where their long, silky fur helps keep them warm. Pikas also inhabit the high, windswept plains—or steppes—of Asia, and dry, barren areas that are almost deserts. Pikas are plant eaters, feeding on grass, leaves, and flowers. Unlike rats and mice, which are rodents, pikas do not hold their food in their front paws when eating. Pikas grind tough plants by moving their jaws from side to side. They are mostly active by day.

Some mammals, such as marmots, that live in high mountains or windy plains survive long, harsh winters in a deep sleep-like hibernation. Pikas do not hibernate. Instead, each pika lays in a store of hay to eat when snow covers the ground. Pikas gather grass in the fall and store it under overhanging rocks to keep it dry. They stay active all winter, tunneling through the snow to reach their hay piles and other food.

With its mouth full of grass, twigs, and leaves, this rock-dwelling pika is collecting food during the late summer to build its winter hay store.

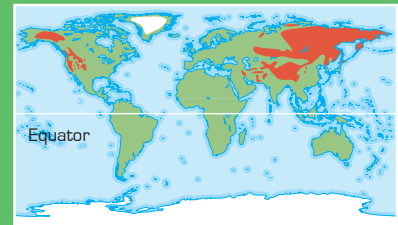
Fact File

PIKAS

Family: Ochotonidae (30 species)

Order: Lagomorpha

Where do they live? Western North America, the Middle East, and central Asia



Habitat: Piles of rocky debris on mountains or burrows in meadows, Asian steppes, and dry areas

Size: Head-body length 4.7–11.2 inches (12–28.5 cm); weight 1.8–12.3 ounces (50–350 g)



Coat: Dense, soft, grayish or reddish fur; upper body darker than underparts

Diet: Plant food, including grass and leaves

Breeding: Rock dwellers—1–5 offspring up to twice a year; burrowers 1–13 offspring up to 5 times a year; 21 days' gestation

Life span: Rock dwellers up to 7 years; burrowers 1–3 years

Status: 5 species are vulnerable; 1 is endangered; silver pika is critically endangered



PIKAS

Rock Dwellers and Burrowers

There are thirty species of pikas, divided into two groups that live in different habitats. In mountains, pikas make their homes among heaps of rocks, called scree or talus, which collect at the foot of mountain slopes. On windswept plains and other barren places, pikas live in burrows.

Rock-dwelling pikas and burrowing pikas differ in many ways, including

in their social habits. Rock-dwelling pikas are loners. Each animal has a territory—the patch of mountain meadow where it feeds. It defends its patch against other pikas of the same sex, driving them away. It is more friendly to pikas of the opposite sex.

Burrowing pikas are more sociable. They live in family groups made up of a mother, a father, and their offspring of different ages. These

▶ *Stretching up on its hind legs, a ground-dwelling pika strips off the leaves on a low-growing twig.*





PIKA COMMUNICATION

Rock-dwelling pikas and burrowing pikas produce different noises to communicate. Rock dwellers have a short alarm call that warns other pikas of danger. The males make long calls, called songs, in the breeding season. Burrowing pikas use a wider range of sounds to communicate with their family. Their calls include whines, trilling sounds, long breeding calls, and short alarm calls.

pikas rest bundled up together. They rub noses and play-fight, chasing one another near the burrow. When on the move, the babies line up behind a parent, usually the father, and follow him in a line, like a tiny train.

Breeding Habits and Life Cycle

The breeding habits of rock-dwelling and burrowing pikas are completely different. Rock dwellers breed relatively slowly. The females usually produce just one or two offspring each year. However, burrowing pikas

are fast breeders—the females can produce as many as thirteen babies at once and can breed five times a year.

Pikas and People

Rock-dwelling pikas live in remote regions where there are few people. Some areas are so remote that scientists do not know how many pikas even exist. Burrowing pikas live in large numbers in some parts of Asia—up to 750 pikas in one acre. Some farmers treat them as pests because they believe pikas damage the grasslands where their animals graze. In parts of China, farmers kill pikas using poison.

However, wildlife experts believe that pikas help improve the soil in the grasslands with their burrows. Pikas also provide food for predators, such as hawks and weasels, and their burrows shelter lizards and birds.

DID YOU KNOW?



In the fall, American pikas spend one-third of their time making hay piles, dashing back and forth with mouthfuls of grass.



Some Asian rock-dwelling pikas add to a shared pile of hay.



Burrowing pikas spend time grooming one another. They comb through one another's fur to remove dirt and fleas.

PLATYPUS

One of the world's most unusual mammals, the duck-billed platypus lives only in Australia. This extraordinary looking creature is a monotreme—a member of the small group of mammals that breeds by laying eggs.





When experts first saw a platypus skin around 1800, they thought it was made by stitching together parts of several different animals. That was hardly surprising because the platypus has a ducklike beak, a flattish body covered with fine fur, like a mole, large, clawed, webbed feet like an otter, and a beaverlike tail. Platypuses live by rivers and streams in eastern Australia. They are nocturnal (active at night), spending the day in riverbank burrows, which they dig with their strong claws. At night, they find food, such as shrimps, by diving underwater. The sensitive, leathery beak picks up tiny electrical signals given off by the prey creatures' muscles. Storing its prey in cheek pouches, the platypus surfaces and grinds the food with horny mouth pads.

Unusually for mammals, male platypuses are armed with poisonous spurs on the back of their hind legs. They may use these spurs to fight or frighten off other males in the breeding season. Platypus poison is strong enough to kill a dog and cause a human great pain.

Egg-laying Life Cycle

Platypuses mate between winter and spring in Australia. Around three weeks after mating, the female lays one to three eggs in a grass-lined nest in a burrow. The leathery shelled eggs hatch after ten days. The babies suck milk from the fur around mammary gland openings on the mother's abdomen. The young grow quickly and leave the burrow after three to four months.

A platypus dives to find food, such as shrimps. When it dives, the platypus shuts its eyes, ears, and nostrils, relying entirely on its sensitive beak to detect prey.

Fact File

PLATYPUS

Ornithorhynchus anatinus

Family: Ornithorhynchidae

Order: Monotremata

Where do they live? Eastern Australia and Tasmania



Habitat: By rivers, streams, and lakes

Size: Head-body length 15–24 inches (39–60 cm); weight 2.2–5.3 pounds (1–2.4 kg)



Coat: Dense, soft fur; dark brown upper body, reddish midline, and paler below

Diet: Water-dwelling insects, shrimps, and crayfish

Breeding: 1–3 eggs hatch around 10 days after being laid; mature after 3–4 months

Life span: Around 10 years in the wild, and up to 17 years in zoos

Status: Lower risk, least concern; scarce in some areas



POLAR BEAR

Polar bears live in the far north. The world's largest bears, polar bears are meat-eating hunters. They hunt mainly seals and also small whales.





Polar bears live in the Arctic. This region is mainly an ice-covered ocean, surrounded by the northernmost parts of North America, Europe, and Asia. Polar bears live out on the sea ice and on remote coasts and islands. They are thoroughly at home on the ice and in water. Their scientific name, *Ursus maritimus*, means “sea bear.” Polar bears are strong swimmers. They paddle with their broad front paws. Their back legs are held out behind to help with steering. They can swim steadily for hours and are often seen far out to sea.

Polar bears are massive, with a stocky, rounded body, a long neck, and a broad head. The males are around twice the size of the females. An adult male polar bear can weigh around 1,320 pounds, which is as heavy as seven adult humans.

Polar bears keep warm in icy water with the help of their thick fur and a layer of fatty blubber just below the skin. Their white fur also provides camouflage, helping the bear blend in with its snowy surroundings. The only parts of the body not covered with fur are the soles of the feet and the tip of the nose.

Skilled Hunters

Most types of bears are omnivores—they eat both plant and animal foods. Polar bears are unusual in that they live almost entirely on meat. Their favorite prey are seals, especially ringed seals. Polar bears hunt seals

A polar bear's white coat helps camouflage it against the ice and snow. It uses its massive clawed front paws to kill seals, walruses, narwhals, and other prey.

Fact File

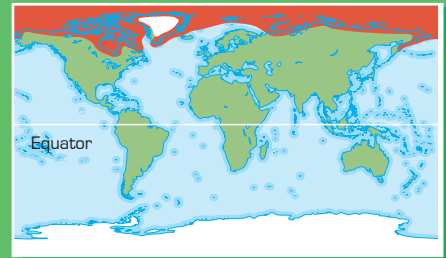
POLAR BEAR

Ursus maritimus

Family: Ursidae

Order: Carnivora

Where do they live? Arctic



Habitat: Sea ice, polar waters, coasts, and islands

Size: Head-body length 5.8–8.3 feet (1.8–2.5 m); weight 440–1,320 pounds (200–600 kg)



Coat: White or yellowish

Diet: Ringed seals and other seals, also walruses, narwhals, belugas, other mammals, and birds

Breeding: 1–3 cubs, usually twins, born after around 8 months' gestation

Life span: Up to around 30 years

Status: Polar bears are threatened by global warming and pollution



POLAR BEAR

out on the ice when the seals surface at holes to breathe. The bear waits by the seal's breathing hole, for hours if necessary. Finally, when a seal pops up to breathe, the bear lunges forward and kills its prey with one bite or a swipe of its huge paw.

As well as ringed seals, polar bears also hunt other types of seals. The bears sneak up on seals that have come up on the ice to sunbathe.

In spring polar bears hunt seal pups, which are born in dens in the ice. Polar bears also hunt walruses, small whales such as belugas and narwhals, land mammals, ducks, and seabirds.

A Polar Bear's Year

Experts believe that there are around 25,000 bears in the Arctic. They live mostly around the southern fringes of the pack ice, where seals are

▶ *A polar bear scans the ice for prey. Polar bears need the thick ice sheets on which to hunt. If the arctic ice keeps melting, polar bears will be in trouble.*



POLAR BEARS AT RISK

Arctic people have hunted polar bears for centuries. Hunting is not a major threat because the hunters are allowed to kill only a certain number of polar bears. However, these bears are harmed by pollution, including oil spilled at sea. In the future they may be threatened by global warming. This worldwide rise in temperatures is being caused by the burning of fossil fuels. Global warming is melting the arctic ice on which the bears depend to hunt.



plentiful. Despite their name, polar bears do not live at the north pole since there is no food for them there.

In winter, the ice-covered area expands as more of the sea freezes over. Polar bears hunt seals out on the ice. In summer, the southern ice melts. Arctic coasts and even large bays, such as Hudson's Bay in Canada, become free of ice. Without ice, the polar bears living there cannot hunt. Instead, they spend several months on land, not eating and living off stored fat. They save energy by resting. In fall, the sea ices over again and the polar bears can hunt once more.


Social Life and Breeding

Polar bears are mainly loners, apart from females with their cubs. However, polar bears gather at large food sources, such as a dead whale. Male polar bears also sometimes spend the lean months of summer in the company of others.

Polar bears breed in April and May. The females spend two and a half years raising their cubs, so they are available to mate only once every three years. That means breeding females are scarce. Male bears often fight for the chance to mate.



Females give birth in late December or January, around eight months after mating. One to three cubs, mostly twins, are born in a snow den. The newborn cubs are blind, almost hairless, and tiny. They remain in the den for several months, feeding on their mother's rich milk. In March or April, they leave the den and follow their mother out onto the ice, where they learn to hunt.

 A polar bear mother leads her cub across the sea ice. Polar bears usually give birth to twins inside a snow den.

DID YOU KNOW?



Underneath the hollow hairs that look white, a polar bear's skin is black!



A polar bear can sniff out a seal's breathing hole from around half a mile away!



Some polar bear mothers do not feed for eight months while they give birth and rear their cubs!

PORCUPINES

Porcupines are rodents, like cavies, coypus, and chinchillas. The porcupines' sharp spines act as protective armor, defending the mammal from most enemies.





Many people mistakenly believe that porcupines are related to pigs and hedgehogs. However, rodents such as guinea pigs, rats, and mice are relatives. Porcupines have a sturdy body with short legs, and a large head with small eyes. The porcupine's body is covered with bristly hairs. The upper body also has an armor of long spines, or quills. These quills are hard, stiff, hollow hairs, made of a substance called keratin. Human hair and fingernails are made of the same material. When threatened by an enemy, porcupines raise their quills. They may also shake the hollow quills on their tail so that they rattle. That acts as a warning signal. In addition, porcupines stamp their hind feet and grunt to show that they are annoyed.

If the enemy continues to threaten, the porcupine spins around and may back toward its attacker. Its quills are loosely attached, so if they pierce an attacker's skin, they break off and stick in the flesh. An infected wound can be fatal. Few predators dare attack a creature armed with such deadly weapons.

Old and New World Porcupines

There are twenty-three species of porcupines. One family lives in Africa, Asia, and Europe, sometimes called the Old World. A second family lives in the New World—the Americas. Old and New World porcupines are not closely related. Old World porcupines live on the ground, while New World porcupines dwell mostly

A North American porcupine looks for food in the winter snow. Porcupines have keen senses of touch, hearing, and smell but are extremely nearsighted.

Fact File

PORCUPINES

Families: Hystricidae (Old World porcupines; 11 species); Erethizontidae (New World porcupines; 12 species)

Order: Rodentia

Where do they live? Africa, Asia, southern Europe, and North, South, and Central America



Habitat: Forests, open grasslands, and deserts

Size: Head-body length 12–34 inches (30–86 cm); weight 2–60 pounds (0.9–27 kg)



Coat: Brown or blackish; upper body covered with long, sharp quills

Diet: Roots, bulbs, fruit, seeds, nuts, bark, leaves, insects, and small reptiles

Breeding: 1–2 offspring born after 90–210 days' gestation

Life span: Up to 21 years in zoos

Status: Most porcupines are common; some forest species are rare






PORCUPINES

in trees. New World porcupines live mainly in forests and woodlands. Old World porcupines thrive in many different habitats, from forests to grasslands and even deserts.

Old and New World porcupines have different features that help them live and move about in their environment. Old World porcupines have strong claws for digging. They live mainly in underground burrows. Old World porcupines include brush-tailed porcupines and crested porcupines, which have extremely long quills. New World porcupines have long, curving claws and ridged, hairless pads on their feet, which help with climbing. The tree porcupines of South America have a prehensile (grasping) tail that wraps around branches. The tail acts as an extra

DID YOU KNOW?

-  South American tree porcupines can hang from branches by just their tail!
-  North American porcupines often climb to great heights for food.
-  The North American porcupine has 30,000 quills on its upper body and tail!

limb while the animal climbs. New World porcupines include prehensile-tailed porcupines, hairy dwarf porcupines, and the North American porcupine, which is widespread in the United States and Canada.

Daily Life

Porcupines feed mainly on plants. They eat roots, bulbs, fruit, and berries. Some New World porcupines also eat seeds, nuts, bark, leaves,

1. *Indonesian porcupine*
2. *African porcupine*





PORCUPINE LIFE CYCLE

Porcupines give birth to a single baby, sometimes twins, ninety to 112 days after mating. North American porcupines take longer to produce offspring, around 210 days. The babies are born well developed and covered with hairs and soft bristles that will become quills. They are quick on their feet, and New World porcupines soon begin climbing. The babies drink their mother's milk but begin to eat solid food after a few days. They take three to four years to mature.



insects, and other small creatures.


Porcupines gnaw on bones to sharpen their teeth and get nourishing minerals. They are active mainly at night. After dusk, they move along well-worn trails to their favorite food sites. They spend the day in an underground burrow, rocky crevice, hollow log, or in the fork of a tree. Some porcupines are mostly loners, but South African Cape porcupines live in groups of up to eight animals in a burrow.

Threats to Porcupines

Porcupines have few enemies in the wild as a result of their sharp spines. However, the fisher, a member of the

weasel family, is able to flip a porcupine onto its back and attack its soft belly, which has no spines. People also kill porcupines for meat and for their sharp, hollow spines, which make good needles, fishing floats, and other tools. Some people see porcupines as pests because they nibble crops and carry ticks and fleas, which can bring disease.

Most porcupines are common and widespread. However, in South America and Southeast Asia, some porcupines are threatened by the destruction of the forests where they live. These forests are being cut down for their timber and to clear space for new farms and villages.

 A group of young North American porcupines gathers at the end of a branch.

PORPOISES

Relatives of dolphins and toothed whales, porpoises are small, shy sea mammals that swim fast in the sea. Many porpoises are threatened by human activities, such as fishing and pollution.





Porpoises and dolphins both evolved from a common ancestor around ten million years ago. Both animals have a sleek, streamlined body; a dorsal fin, flippers, and a blowhole on the top of their head. However, porpoises have a short, rounded snout, instead of the dolphin's long, beaklike snout. Porpoises also have flat, spade-shaped teeth, while dolphins have cone-shaped teeth. Both dolphins and porpoises feed mainly on fish and use their teeth to hold their prey rather than for cutting or chewing their food. Porpoises do not seem to help each other catch food, as do many species of dolphins. Harbor porpoises can dive deeper than 650 feet in search of prey.

Social Life and Conservation

Living alone or in small groups, most porpoises are hard to see or follow, and much of their social life remains a mystery. The only lasting links among porpoises is between a mother porpoise and her calf. Some older calves may stay with their mother for a short time after they stop drinking her milk.

The coastal waters where many porpoises live are also used by large numbers of people. Porpoises are badly affected by pollution, the noise of boat engines, and people digging deep channels for ships near the coast. However, the greatest danger occurs when many thousands of porpoises are trapped accidentally in fishing nets. Porpoises die if they cannot breathe air.

A harbor porpoise cruises above a bed of seaweed, looking for food. These porpoises have a triangular dorsal fin, a rounded snout, and a white underside.

Fact File

PORPOISES

Family: Phocoenidae (6 species)

Order: Cetacea

Where do they live? Most major oceans and the Black Sea but not the Mediterranean Sea



Habitat: Coastal waters, oceans, and seas

Size: Head-tail length
4–8 feet (1.3–2.4 m);
weight 77–485 pounds
(35–220 kg)



Coat: Light gray, dark gray, or black on back and sides; underside light or white; some have flipper stripes

Diet: Mostly small fish; also squid

Breeding: Reach adulthood at 4–7 years; gestation 11 months; usually one calf; many porpoises breed in late spring–early summer

Life span: 12–23 years

Status: Harbor porpoise vulnerable; vaquita critically endangered; Dall's porpoise lower risk, conservation dependent

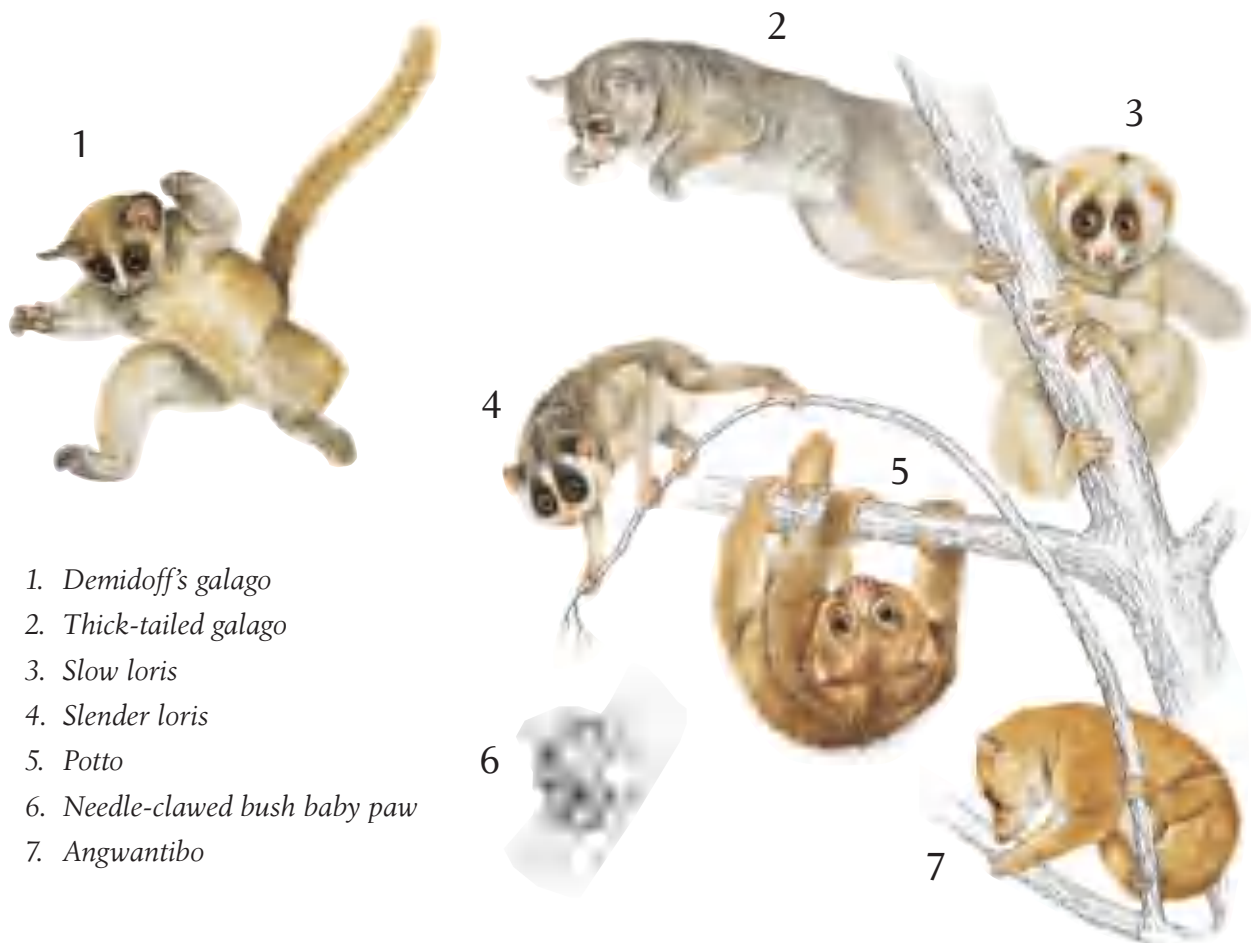
PRIMATES

From monkeys and apes to lemurs, tamarins, and bush babies, primates are clever, social mammals, with a large brain and excellent vision. Humans are also primates, in the same family as gorillas, chimpanzees, and orangutans.

There are two main groups of primates. One group includes bush babies, pottos, lorises, lemurs, and the aye-aye. These primates

do not live in the Americas. They have a longer snout, a better developed sense of smell, and a smaller brain than the other group of primates, which includes monkeys, apes, and tarsiers. Old World monkeys from Africa and Asia have close-set nostrils that point downward and hard sitting pads. New World monkeys from the Americas have wide nostrils that face to the side and no sitting pads. Many of these primates also have a prehensile (grasping) tail.

Around 75 percent of all primates, such as gibbons, spider monkeys, colobus monkeys, and howler monkeys, live in the trees of tropical



1. *Demidoff's galago*
2. *Thick-tailed galago*
3. *Slow loris*
4. *Slender loris*
5. *Potto*
6. *Needle-clawed bush baby paw*
7. *Angwantibo*



▲ A *Hamadryas baboon* sits on its haunches. These baboons live in Africa and the Middle East.



▲ *Orangutans* are critically endangered primates that live only on the islands of Borneo and Sumatra.

forests. They are active during the day and eat fruit and leaves. The rest of the primates are split between nocturnal (night-active) primates, such as tarsiers and bush babies, which feed on

Fact File

PRIMATES

Order: Primates

Families: 16 families

Species: 365 species

Where do they live?

Central America, South America, Africa, Madagascar, India, Southeast Asia, Japan, China, and Gibraltar



Habitat: Mostly tropical forests; also temperate forests, grasslands, deserts, mountains, coasts

Size: Head-body length of male gorilla 5.6 feet (170 cm); mouse lemur 4 inches (12.5 cm); weight of male gorilla more than 331 pounds (150 kg); mouse lemur up to 2.3 ounces (65 g)

Coat: Gray, brown, black, white, golden, or orange; some with brightly colored faces (mandrill, uakari); ring-tailed lemurs have a striped tail

Breeding: Reach adulthood from a year (mouse lemurs) to 10 years (gorillas); usually 1–2 offspring at a time

Life span: From 15 years (mouse lemur) to 40 years (gorilla)

Status: Almost half of all primate species are at risk, including all great apes and most lemurs

insects and fruit in the trees, and day-active primates, such as baboons and chimpanzees, which live on the ground and eat fruit. However, gelada baboons eat grass, and marmosets eat tree gum. Male chimpanzees and baboons sometimes work together in groups to hunt small antelope and monkeys.

PRIMATES


Size Matters

The size of a primate is closely linked to its lifestyle. Many predators are active during the day, so day-active primates tend to be larger than nocturnal species. Primates that live on the ground also tend to be larger than those that live in the trees. Ground-living primates have to defend themselves from attacks by both ground predators, such as leopards, and flying predators, such as eagles. Most of the larger primates eat leaves because there are a lot more leaves available than fruit or insects. Leafy greens are tough and hard to digest, so leaf-eating primates have grinding teeth and bacteria in their gut that help break down their food. Fruit-eating primates have large cutting teeth (incisors) that bite into fruit and a simple digestive system because fruit is easier to break down than leaves.

Safety in Numbers

Most primates live in groups, helping each other find food and warning each other of attacks by predators. Vervet monkeys have different warning calls for different predators, such as big cats, eagles, and snakes. The



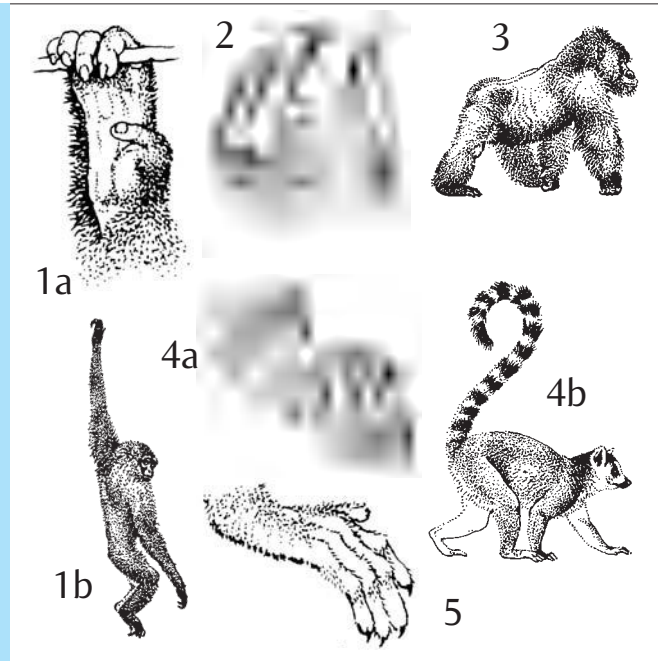
 This family group of cotton-top tamarins includes a father with an infant on his back, a mother, and several offspring of various ages.

disadvantage of living together is that there is more competition for food in a big group.

The center of primate groups is the female and her offspring. Some small groups consist of just a male, a female, and their offspring.

PRIMATE HANDS AND FEET

The fingers and toes of primates suit their different ways of life. Gibbons have long fingers (1a) that help them swing from branches (1b). The small thumb does not get in the way. All apes, like the gorilla, can press the thumb against each finger to grasp things carefully and firmly (2). Gorillas walk on their foreknuckles (3). Baboons (4a) and some lemurs (4b) walk with their feet flat on the ground. Tamarins have claws for gripping branches (5).






Gibbons, night monkeys, and the indri live in this way. Baboons, colobus monkeys, and gorillas live in larger groups, with one male leading a harem (group) of several females with their babies. Larger numbers of females may form groups with several males, as happens with groups of capuchins, howler monkeys, and macaques. A more flexible type of primate group is that of chimpanzees and spider monkeys. The size of these unstable groups varies constantly as individuals come and go, but these groups of primates belong to larger communities that are stable.

Within a primate group, the strongest individuals win fights. That makes them the most important, or dominant, members of the group. Dominant individuals usually

mate with more females and have the most offspring. Primates often form friendship groups and become more powerful because they have friends to help them during fights or conflicts. Family members may also support each other during power struggles.

DID YOU KNOW?

-  The biggest primate, a male gorilla, can be up to 6,000 times as heavy as the smallest primate, the mouse lemur!
-  Gelada baboons live in large groups with 150 to 600 members.
-  In the last 1,000 years, people have caused the extinction of fifteen species of primates on the island of Madagascar.

PRIMATES

Threats to Primate Survival

Primates are more widely threatened with extinction than most other mammals. Many species of primates are classified by the International Union for the Conservation of Nature (IUCN) as endangered or critically endangered. Some of these species, such as the orangutan and the Moloch gibbon, may become extinct over the next fifty years.

The main threats to primates are habitat disturbance and hunting. People are cutting down tropical forests at an alarming rate for their valuable timber and to turn the forests into farmland. People usually hunt primates for food (bush meat), although some are caught

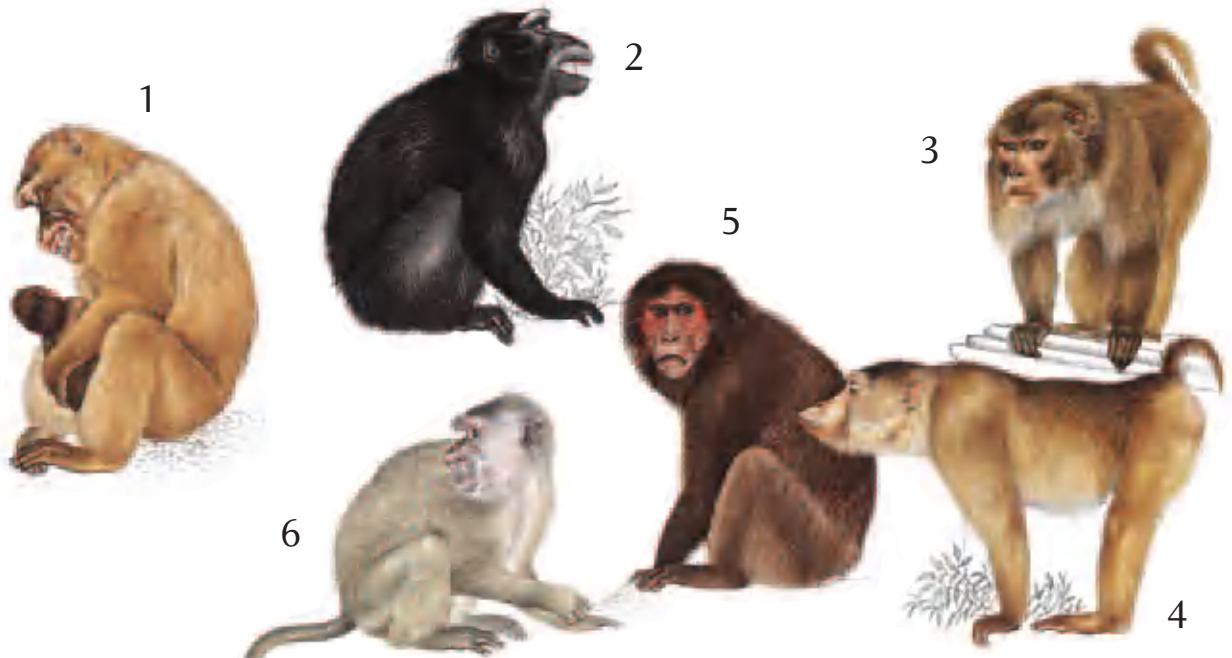


🟡 *Young gorillas play in the trees. Gorillas take longer to wean—up to three years—than humans.*



SEEING IN COLOR

Humans, apes, and monkeys from Africa and Asia are able to see in full color, unlike most other mammals. Color vision may have evolved since primates need to pick out colorful fruit against a green, leafy background. In monkeys from the Americas, there is much more variation in color vision. Some New World monkeys can see in full color, some can see a smaller range of colors, while some cannot see colors at all. Night monkeys (left) and bush babies do not need to see in color because they come out only at night.






1. *Barbary macaque*
2. *Moor macaque*
3. *Rhesus macaque*
4. *Southern pig-tailed macaque*
5. *Stump-tailed macaque*
6. *Long-tailed macaque*
7. *Bonnet macaque*

their numbers. The best way to conserve primates is to protect the animals within their natural habitats. Some help may also be provided if tourists pay to see and photograph these mammals in the wild. Primates bred in captivity in zoos or wildlife parks can also be reintroduced into the wild, although this process is usually expensive and not always successful.

and traded alive for medical research.

Some primates are killed for their skins or body parts, which may be used in traditional Eastern medicines. Large primates, such as mandrills and gorillas, are the most vulnerable to extinction because they are easy to find and provide a lot of meat. Large primates also breed slowly, so their populations are slow to recover

DID YOU KNOW?

-  A spider monkey can hang from a branch by its tail alone.
-  A gorilla has fingers the size of bananas!
-  A young orangutan stays with its mother for seven to nine years.

PRONGHORN

Pronghorn live only in North America, but they look and behave like African gazelles. The pronghorn is famous for running fast over long distances and for being an inquisitive mammal.





Pronghorn are named after the large, hooked, pronglike horns of the males (bucks). The females (does) have smaller horns. Pronghorn shed their horns each year after the breeding season. Pronghorn communicate with scent messages during courtship and also produce warning scents. The long, pointed hooves of pronghorn are cushioned to absorb the impact of bounding along rapidly with long strides. Large, protruding eyes give pronghorn all-round vision, while their long, black eyelashes act like sun visors.

The two- to three-week mating season, called the rut, takes place between late August and early October. Bucks may defend a territory (feeding and breeding area) from other bucks from March until the end of the rut. The fawns are born in late May or early June. Twins are common if there is plenty of food to eat. For at least the first twenty days, the fawns hide among bushes away from predators, such as coyotes and golden eagles. The mothers feed their fawns for four to five months.

Back from the Brink

Conservation efforts have saved pronghorn from near extinction. There are now more than a million pronghorn in North America. They are still threatened, however, by oil drilling, coal mining, and habitat loss. In addition, roads built for oil fields allow poachers to reach remote areas and kill pronghorn illegally, while fences keep pronghorn out of favorable habitats.

A male pronghorn lies down on the grass for a rest. When running, pronghorn can move at speeds of up to 55 miles per hour, taking 27-foot strides.

Fact File

PRONGHORN

Antilocapra americana

Family: Antilocapridae; subfamily Antilocaprinae (4 subspecies, or local types)

Order: Artiodactyla

Where do they live? United States and Canada, and parts of Mexico



Habitat: Open grasslands and brushlands; rarely, open coniferous forests

Size: Head-tail length 55 inches (141 cm); weight 103–154 pounds (24–70 kg)



Coat: Upper body tan, underside largely white, rump all white; black face mask on mature males

Diet: Grass, herbs, shrubs, cacti, and crops

Breeding: Reach adulthood at 16 months; 1–2 fawns

Life span: 9–12 years in the wild, and 12 years in zoos

Status: Peninsular subspecies is critically endangered; Sonoran subspecies is endangered

RABBITS AND HARES

Rabbits and hares are easy to recognize by their long ears and long back legs. Their fine, soft fur even grows on the soles of their feet. In cold places, some species turn white in winter, which camouflages them against the snow.





The two main differences between rabbits and hares are the way in which they escape from predators and the way in which they reproduce. Hares have longer legs than rabbits and try to escape predators by running very fast in the open. Rabbits run to the safety of dense cover or underground burrows if they sense danger. Both rabbits and hares have large eyes on the side of the head, which gives them good, all-round vision and helps them spot predators. Baby hares are better developed at birth than young rabbits. Hares are born covered in fur and with their eyes open. Baby rabbits are born without any fur, or with only a sparse covering, and their eyes are closed.

Teeth and Diet

Rabbits and hares are herbivores (plant eaters) that feed mainly on grass, but they eat a variety of other plants in different habitats. They have two long front teeth, called incisors, that grow all the time but are worn down as the animals bite and gnaw plant food. There is also a second pair of small incisors, called peg teeth. Rabbits and hares have a total of twenty-eight teeth; young human children have only twenty teeth.

The digestive system of rabbits and hares can break down large amounts of plant material. Bacteria in the gut help break down tough plant cellulose. Rabbits and hares also eat some of their droppings to ensure they get as much goodness as possible from their food.

A white-tailed hare stands tall, keeping a lookout for predators. It has large eyes on either side of its head and can move its ears to detect sounds.

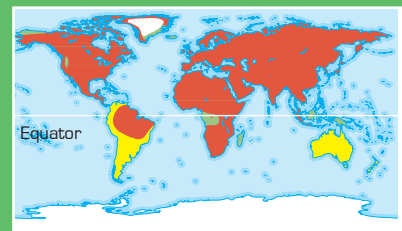
Fact File

RABBITS AND HARES

Family: Leporidae (62 species)

Order: Lagomorpha

Where do they live? Americas, Europe, Asia, and Africa; introduced (yellow) to Australia, New Zealand, and South America



Habitat: Varied, including deserts, mountain forests, tropical rain forests, arctic tundra, swamps, tall grasslands, and farmland

Size: Head-body length 10–30 inches (25–75 cm); weight from 0.9–13.2 pounds (400 g–6 kg)



Coat: Brown, gray, or white; belly often lighter or white

Breeding: Reach maturity at 3 months; usually 1–8 offspring; weaned at 21 days

Life span: Usually less than a year in the wild, and 6–12 years in captivity

Status: 12 species are critically endangered, endangered, or vulnerable; 6 species are near threatened



RABBITS AND HARES

▼ *The jackrabbit has unusually large ears that help the animal lose heat when it becomes too hot.*

Open Habitats or Dense Cover

From deserts and grasslands, to the arctic tundra, most hares prefer to live in open habitats, with some cover for daytime shelter. One exception is the snowshoe hare, which lives in cold forests and may burrow into the snow. The snowshoe hare makes up 80 to 90 percent of the diet of the Canadian lynx. A small number of

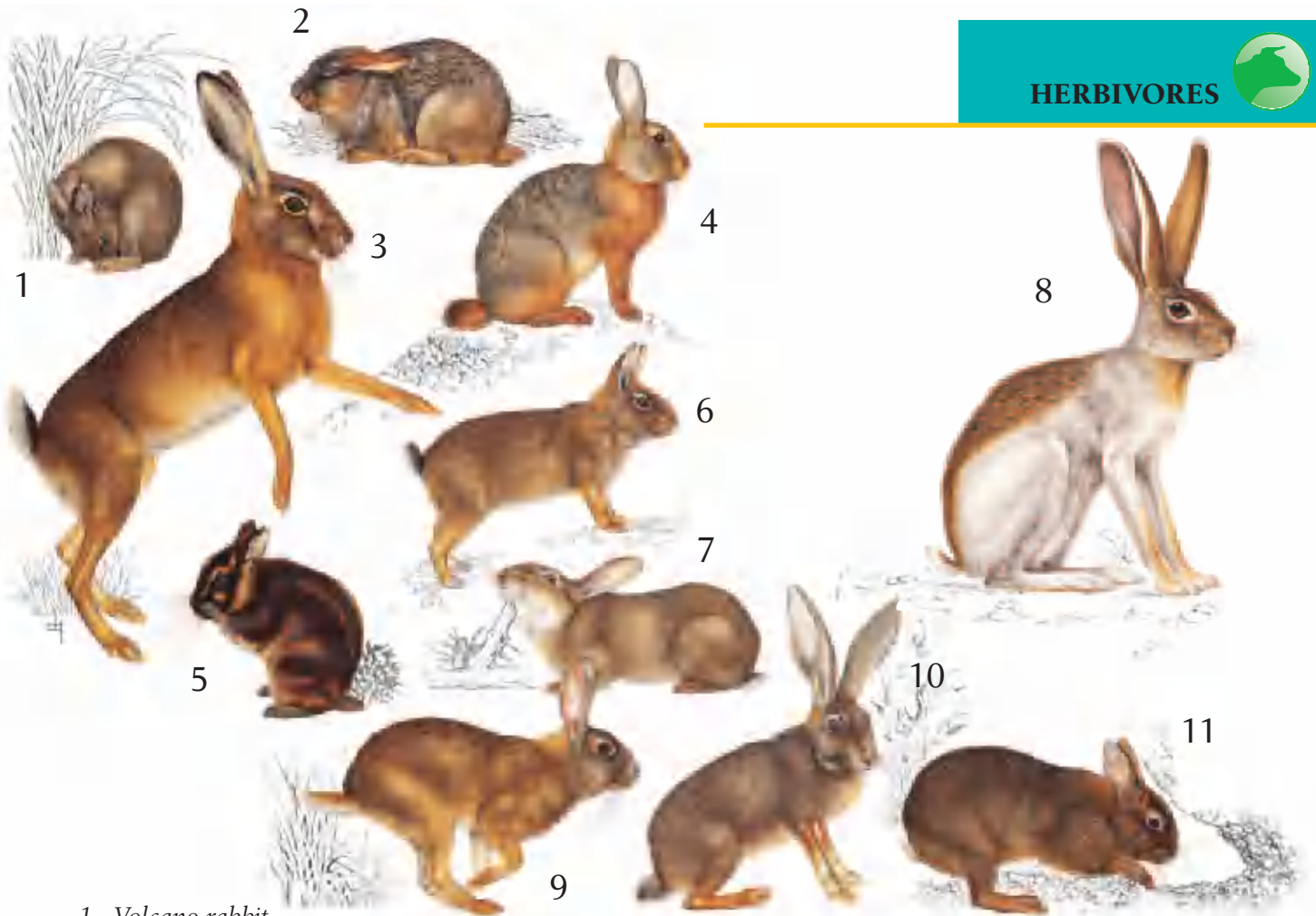
hares, such as the black-tailed jackrabbit, a type of hare, and the Cape hare, dig burrows to escape high temperatures in the desert.

In contrast, rabbits rarely live far away from dense cover or underground tunnels. Some rabbits live only in particular types of habitats. For example, the two-striped Sumatran rabbit, the Annamite rabbit, and the Japanese Amami rabbit live in tropical forests, while the riverine rabbit lives in scrubland alongside rivers in South Africa.



Communication by Scent

All rabbits and hares have scent glands under the chin and in the groin. These scents seem to be important during courtship and mating. Rabbits and hares usually communicate with scent messages, rather than by sounds or visual signals. They make high-pitched distress calls, however, if they are captured by a predator; five species of rabbits also give alarm calls. In addition, European, brush, and desert rabbits thump their back legs on the ground to warn each other of danger. Many species of rabbits and hares have a white underside to their tail, which may



1. *Volcano rabbit*
2. *Hispid hare*
3. *European hare*
4. *Natal red rockhare*
5. *Sumatran striped rabbit*
6. *Male eastern cottontail*
7. *European rabbit*
8. *Antelope jackrabbit*
9. *Bunyoro rabbit*
10. *Riverine rabbit*
11. *Amami rabbit*




act as a visual warning signal to other rabbits and hares when they are running away from a predator.

Rabbit Parents and Babies

Male rabbits and hares do not help look after the babies. Even mothers do not spend much time doing this. That may be because the mothers do not want to attract predators to the offspring. Baby hares, or leverets, are born in shallow hollows on the ground, called forms. These forms may be temporary refuges occupied

for only a few hours or well-established sites used by one generation after another. Mother rabbits pull out some of their fur to make a warm nest for their babies,

DID YOU KNOW?

-  A European rabbit warren can have as many as sixty entrances!
-  The female eastern cottontail rabbit may give birth to around thirty-five babies in a year!
-  Rabbits and hares are related to pikas, small, fluffy mammals that live in rugged surroundings.

RABBITS AND HARES

which are called kittens. The nest is either in an underground burrow or in dense cover.

Baby rabbits and hares suckle milk from their mother only once every twenty-four hours, and for less than five minutes at a time. The rich milk is full of nutrients and can be pumped into the babies at great speed for a period of up to twenty-three days. After that, baby rabbits and hares start to eat solid food, and the mother prepares for the birth of her next litter. Mother rabbits and hares can give birth to several litters of babies in a year, and the offspring are ready to start breeding themselves when they are just a few months old.

Conservation

A few rabbits and hares, such as the European rabbit and European hare, are common. These animals often cause a great deal of damage to crops and forestry plantations. However, many species of rabbits and hares are now threatened with extinction, mainly because people are destroying their habitats. Most of these rare species live only in specialized habitats. The riverine rabbit, for example, survives only in a few areas of scrubland next to two rivers in South Africa. Its habitat has been destroyed so that people can use the river water to irrigate their crops. The tiny Mexican volcano rabbit, or



RABBIT BURROWS





Unlike other rabbits and hares, the European rabbit digs its own burrows. Female rabbits do most of the digging. The burrows vary from a small tunnel with one entrance (a stop), to lots of linked underground tunnels that together form a home for many rabbits, called a warren. Inside their burrows, rabbits are safe from most predators. That is especially important in open habitats, such as grasslands. Deep underground in a big warren, the rabbits can also raise large numbers of offspring in safety. The larger the warren, the more female rabbits live there.




zacatuche, lives only on the slopes of a few volcanoes around Mexico City, one of the world's largest cities.

The Sumatran striped rabbit was thought to be extinct, but has now been seen again in its tropical forest habitat. A second species of striped rabbit, the Annamite striped rabbit, has also been discovered in the remote mountain forests between Laos and Vietnam in Southeast Asia.

DID YOU KNOW?

-  Hares can sprint across open fields at speeds greater than 45 miles per hour!
-  There are more than 100 varieties of pet rabbits!
-  The long ears of jackrabbits can grow to more than 7 inches!
-  The saying "Mad as a March hare" comes from the wild behavior of hares in the spring mating season!

 *Bounding across the snow, a snowshoe hare is camouflaged during the winter by its white coat. In spring, it will shed this coat to reveal a brown coat beneath.*

RACCOONS

Relatives of the dog family, members of the raccoon family have a long body and tail and are good at climbing. Common raccoons have learned how to live near people in towns and cities, raiding garbage for leftover food scraps.





The raccoon family includes the familiar masked bandit, or common raccoon, coatis, ringtails, cacomistles, kinkajous, and olingos. The red panda is also probably related to raccoons, but scientists have placed it on its own in a separate family, called Ailuridae. Members of the raccoon family are nocturnal (night active), except for coatis, which are mainly active during the day.

The common raccoon eats almost anything, from fish, crayfish snails, and worms, to fruits, berries, nuts, and seeds. It often takes corn cobs from farmers' fields. However, red pandas and kinkajous are mainly vegetarian, while coatis are mainly insect eaters. Ringtails and cacomistles are predators, catching animals up to the size of rabbits. They have large ears, which help them find their prey.

Baby Raccoons and Conservation

Female raccoons give birth in dens or nests, such as tree holes, cellars, log piles, and haystacks. There are usually three to four poorly developed offspring in a single litter. Female raccoons look after the babies alone.

The conservation status of raccoons varies a great deal according to species. The common raccoon is growing in numbers, while some of the other raccoon species that live on islands are endangered or extinct. Red pandas, olingos, and cacomistles are threatened, mainly due to the destruction of their forest habitats.

A pair of common raccoons on the lookout for food. Common raccoons have a distinctive black eye mask across their face, with gray bars above and below.

Fact File

RACCOONS

Family: Procyonidae (3 species)

Order: Carnivora

Where do they live? North America, including Central, and South America



Habitat: Forests, grasslands, lakes, streams, marshes, and urban areas

Size: Head-body length 22 inches (55 cm); tail length 10 inches (25 cm); weight 6.6–18 pounds (3–8 kg)



Coat: Gray, sometimes reddish; ringed tail; black face mask with gray bands above and below

Diet: Fish, crayfish, clams, worms, snails, fruit, berries, corn, and nuts

Breeding: Mature 1–2 years; usually 3–4 offspring; 9 weeks' gestation

Life span: 13–16 years in the wild, and up to 17 years in captivity

Status: Cozumel Island raccoon is endangered; Tres Marias Islands raccoon, Bahaman raccoon, and Guadalupe raccoon are endangered



RATS AND MICE

Rats and mice are usually small, seed-eating creatures that come out at night and have lots of babies. There are nearly 1,000 species, all of which can adapt quickly and survive harsh conditions.





Rats and mice are an extremely varied group of mammals. They probably evolved from a small, mouselike ancestor that was around 4 inches long and had a scaly tail of the same length. This ancestor had well-developed senses of sight, hearing, smell, and touch. It also had incisors (cutting teeth) at the front of its jaw, which grew all the time but were kept short and sharp by gnawing on food. Molars (grinding teeth) on the sides of the jaws and powerful jaw muscles helped these mice chew a wide range of food and prepare material for their nests. Like present-day rats and mice, these ancestors would have produced lots of babies and increased their numbers rapidly. Their small size would have allowed them to live in a wide variety of habitats. During evolution, rats and mice have developed a wide range of different adaptations. However, they are still remarkably similar to their ancestors who lived millions of years ago.

A Tale of Long Tails

Rats and mice usually have almost hairless tails, but some species have evolved a different type of tail to help them survive. For example, Australian hopping mice and wood mice use their extra-long tail to help them balance. Harvest mice have a prehensile (grasping) tail, which they use to cling to grass stems as they climb. In some species, including the greater tree mouse, the tail has sensitive hairs at the tip. Bushy-

A wood mouse balances on its hind legs, holding food between its forepaws as it eats. Wood mice are one of the most common European small mammals.

Fact File

RATS AND MICE

Family: Muridae (976 species)

Order: Rodentia

Where do they live?

North America, South America, Europe, Asia, Africa (excluding Madagascar), and Australia; also many islands near the shore



Habitat: Varied, including forests and grasslands; excluding mountain peaks and northern arctic regions

Size: Head-body length 1.8–19 inches (4.5–48 cm); tail length 1.1–13 inches (2–32 cm); weight 0.2 ounce–4.4 pounds (6 g–2 kg)



Coat: Brown back with lighter colored or white belly; some have stripes for camouflage

Diet: Mostly plants and invertebrates; some eat small vertebrates, including fish

Breeding: Several litters in a year, with 2–12 babies in a litter; independent after a few weeks

Life span: 1–2 years in the wild; some live up to 6 years in captivity

Status: 23 species are critically endangered, including some rock rats; 60 species are endangered, including some wood rats and fish-eating rats



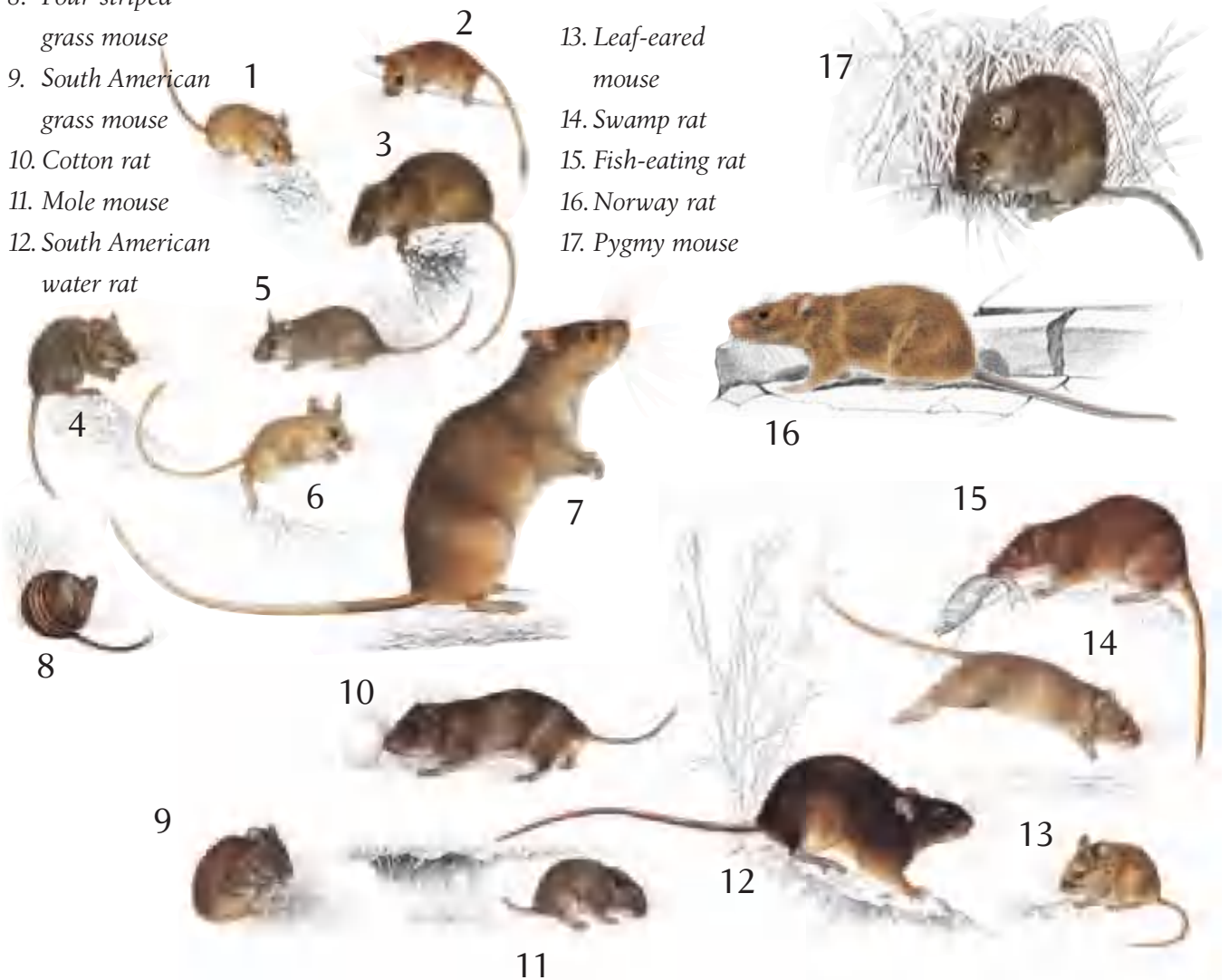
RATS AND MICE

1. *Spiny mouse*
2. *Pencil-tailed tree mouse*
3. *African marsh rat*
4. *Brush-furred rat*
5. *Natal rat*
6. *Hopping mouse*
7. *Smooth-tailed giant rat*
8. *Four-striped grass mouse*
9. *South American grass mouse*
10. *Cotton rat*
11. *Mole mouse*
12. *South American water rat*

tailed cloud rats and wood rats have thick fur on their tail. To help them escape from predators, rock rats and spiny mice are able to break off part of their tail or even the whole tail and make a quick getaway. Unlike lizards, which also shed their tail to escape predators, these small mammals cannot grow a new tail to replace the missing one.






Rodent Hands and Feet

Rats and mice have developed a variety of adaptations to their hands and feet. Climbing species can often move their big toe to touch all their other toes, giving them a firm grip around twigs or stems. Wide hands and feet also give a good grip, as in the pencil-tailed tree mouse and Peter's arboreal forest rat. Jumping





DID YOU KNOW?

-  The salt-marsh harvest mouse is one of the few mammals able to drink seawater.
-  Most people can hear the high-pitched squeaks of grasshopper mice from around 330 feet away.
-  A house mouse can have around 120 babies in just one year!
-  The vesper rat of Central America lives in rain forest trees and builds nests similar to those of red squirrels.
-  In some countries, people can develop bubonic plague if they are bitten by rat fleas. From the fourteenth to the seventeenth centuries, bubonic plague killed around twenty-five million people in Europe before people understood how the disease was spread.

species, such as Australian hopping mice, have long back legs and feet. Species living in wet, marshy places or streams, such as fish-eating rats, water mice, marsh rats, and African swamp rats, may have fringes of hairs on their toes or webs of skin between their toes that help them swim.

Claws also vary greatly according to lifestyle. Short, curved claws help species such as Peter's arboreal forest rat cling onto bark and other rough



PET RATS AND MICE

People first started to keep mice as pets more than 250 years ago in China and Japan. Sailors probably took pet animals home with them to western countries. Tame mice are larger than wild mice and have a variety of colors and patterns. They also have larger ears and eyes, and a longer tail. People started keeping rats as pets around 150 years ago. There are fewer varieties of pet rats than pet mice because rats have not been bred by people for as long.



LIVING UNDERGROUND

The blind mole rats of Europe and the Middle East, including North Africa, are well suited to a life underground. Their eyes are hidden under the skin, and they have no ears on the outside of the head. They rely on short, sensitive hairs to feel their way through their dark tunnels. Each blind mole rat digs its own system of tunnels, which may be as long as 1,150 feet. These vegetarian rats feed on underground stems, roots, bulbs, and whole plants, which they pull down into their tunnels by the roots. In their food chambers, blind mole rats may store as much as 31 pounds of plant material.

surfaces. Large, strong claws help burrowing species, such as mole mice, shrew mice, and the lesser bandicoot rat, to dig tunnels and find food underground.

Baby Rats and Mice





Most rats and mice give birth to blind and naked offspring, whose eyes only open after around ten to twelve days. One exception is the big-eared climbing rat of Central America, which produces babies that are covered in fur at birth. These babies are well developed and open their eyes after just six days. They grow inside their mother for around six and a half weeks, compared with the three-week gestation (pregnancy) for most other rats and mice.

The hispid cotton rat also gives birth to furry babies; their eyes open after only three weeks. In this species, five to eight babies are born at a time, and the female can produce a new litter every month during the breeding season.

Female rats and mice do most of the work caring for the offspring, but male white-footed mice often defend their babies, help keep them warm, and bring youngsters back to the nest if they wander off on their own.




DID YOU KNOW?

-  Mole rats spend most of their life underground.
-  The woolly giant rat may be 11 inches long, with a tail up to 6.3 inches long!
-  The earless water rat of Papua new Guinea has no ears on the outside of its head. That makes its body more streamlined for swimming underwater.
-  One species of wood rat feeds only on the leaves of juniper trees.

White-footed mice feed on their mother's milk for around twenty-one to twenty-four days, after which time they are ready to leave the nest.

Living with People

Some rats and mice eat human food and crops, damage property, and carry diseases, such as plague, lassa fever, typhus, and rat-bite fever. The most important rats and mice to live with people are the Norway rat (also called the brown rat, or common rat), the roof rat, and the house mouse. The Norway rat lives in sewers, cities, and ports. People often kill rats and mice because of the damage they cause. The beaver rat of Australia has been hunted for their long, thick fur. This hunting is now controlled, and the species is on the increase. Other mice and rats are threatened because people are destroying their habitats.

 *Norway rats eat and drink almost anything, including milk. These rats often live near people.*



RHINOCEROSES

With their massive body, leathery skin, and long horns, rhinoceroses look more like dinosaurs than mammals. Rhinos have lived on Earth for forty million years and evolved long after dinosaurs died out sixty-five million years ago.





Rhinoceroses are hoofed mammals related to horses, zebras, asses, and tapirs. Rhinos have short, thick legs that support their great weight. White rhino and Indian rhino males are much larger than females. In the other rhino species, males and females are both around the same size. Each species has different characteristics. The Indian rhinoceros looks as if it is wearing a suit of armor because of its lumpy, wrinkled skin. The black and white rhinoceroses are both gray. However, the black rhino has a pointed top lip, and the white rhino has wide lips.

Food and Water

All rhinos are herbivores (plant eaters), and they eat a lot of plant food every day to keep their huge, barrel-shaped body supplied with enough energy. The broad lips of the white rhino give it a wide area of bite, helping it crop short grass for much of the year. Black rhinos and Indian rhinos both have a prehensile (grasping) top lip, which picks leaves and twigs from woody plants. They also eat fruit, as do Sumatran rhinos.

All rhinoceroses drink water every day from pools and rivers whenever possible. At dry times, both black rhinos and white rhinoceroses can survive for up to four to five days without water. As well as drinking water, rhinos also depend on water holes for wallowing in the mud. They coat their skin with mud, which probably helps protect them against biting flies.

A white rhinoceros pauses while it searches for fresh grass to eat. White rhinos have a wide, unhooked upper lip that enables them to graze easily.

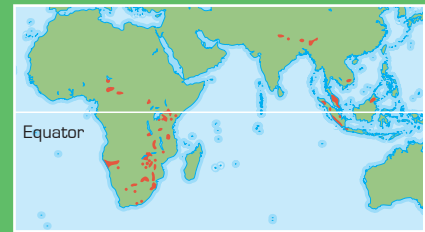
Fact File

RHINOCEROSES

Family: Rhinocerotidae (5 species)

Order: Perissodactyla

Where do they live? Africa and Asia



Habitat: Rain forests, grasslands, and scrublands

Size: Head-body length
10–13 feet (3–4 m);
weight 1.1–2.6 tons
(1–2.3 metric tons)



Coat: Gray to brownish gray

Diet: Mainly grass; also herbs, acacias, euphorbias, and fruit

Breeding: Reach adulthood at 5–8 years; 1 calf; independent after 2–3 years

Life span: 32–45 years

Status: Indian rhinoceros endangered; black rhinoceros, white rhinoceros, Javan rhinoceros, and Sumatran rhinoceros critically endangered

RHINOCEROSES

Eyes, Ears, and Nose

Rhinos have poor eyesight, but their sense of smell is excellent. A rhino also has keen hearing and can swivel its ears to pick up the quietest sounds. Rhinos can sometimes be noisy: They snort, honk, and roar to tell other rhinos to keep their distance. When they are defending themselves, rhinos may shriek or bleat loudly. Calves may also squeal when they are hungry and want their mother's milk.

Rhino Babies

Female rhinos have their first calf when they are between five and eight years old. The calf takes sixteen months to develop inside its mother. A white rhino calf follows its mother when it is only three days old. The calf runs in front of its mother, and she stands

over it if danger threatens. A black rhino calf usually runs behind its mother because it lives in thicker bush rather than open areas of grassland. A calf stays with its mother until it is two to three years old, but adult rhinoceroses live alone. Adult male rhinos of all species often have nasty fights, wounding each other with their sharp horns and teeth.

Conservation

Of the five species of rhinos now alive, two are critically endangered, while the other three are increasingly threatened. The black rhino once roamed over much of Africa south of the Sahara desert. From 1970 to the late 1990s, around 97,000 black rhinos were killed for their horns. The horns are made into dagger

DID YOU KNOW?



Woolly rhinos lived in Europe during the last ice age, only 15,000 years ago!



The white rhinoceros is the world's third largest land mammal.



Rhinos cannot see a person standing still more than 100 feet away.

DIFFERENT SPECIES OF RHINOCEROSES

1. *Indian rhinoceros*
2. *Javan rhinoceros*
3. *Sumatran rhinoceros*
4. *Black rhinoceros*
5. *White rhinoceros*





RHINOCEROS HORNS

The word *rhinoceros* means “nose horn.” A rhino’s horn is made of rough hairs packed tightly together and perched on top of a rough area on the skull. Rhino horns are completely different from cattle or sheep horns, which have bone in the middle. Black rhinos (right), white rhinos, and Sumatran rhinos have two horns. The front horn is usually the largest horn. A white rhino’s front horn can grow up to twice as long as a person’s arm. Indian and Javan rhinos have just one horn on the end of their snout.



handles in Yemen in the Middle East and ground up to use in medicines in Asia. Now, there are very few black rhinos left; most survive only in guarded game preserves. Rhino survival depends on armed protection

and on the money from tourists who want to see and photograph rhinos. However, there is still a constant threat from poachers, and problems with overcrowding in preserves, including competition with elephants.



RIGHT WHALES

Right whales were named because they were the “right” whales to hunt. They were easy to catch because they swam slowly and floated when they were killed. Protected since 1935, their numbers are still low.





There are four species of right whales—the northern right whale, the southern right whale, the bowhead whale, and the pygmy right whale. The pygmy right whale is much smaller and slimmer than the other right whale species. It is also the only right whale to have a small, triangular fin on its back.

All right whales share several features in common, including a large head, a top jaw shaped like an arch, and long, slender baleen plates in the mouth, which are used for filtering food from seawater. The larger species of right whales do not have throat grooves, but the pygmy right whale has two such grooves. These pleatlike grooves enable the throat of the pygmy right whale to expand and take in lots of water as it feeds.

All right whales, except bowhead whales, have patches of thick skin, called callosities, that form above the eyes and along the lower jaw. Each whale has a different pattern of patches, which is larger in males than in females. Callosities help scientists identify individual whales. Colonies of tiny creatures called whale lice live within the patches. These patches may be important when males compete for females. During courtship, female right whales call to attract males but do not sing complex songs, as do humpback whales.

Right whales often leap out of the water or slap the water with their tails, in an action called lobtailing. Experts do not know why the whales do this, but it may help them communicate their position to other

Showing its enormous flippers, a southern right whale breaches close to the shoreline before returning to the water with a resounding splash.

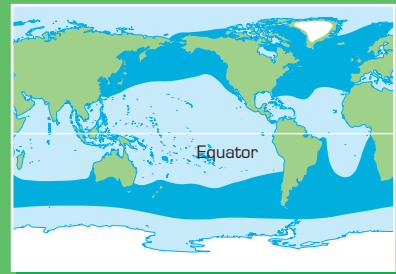
Fact File

RIGHT WHALES

Families: Balaenidae and Neobalaenidae
(4 species)

Order: Cetacea

Where do they live? Arctic and temperate oceans



Habitat: Coastal waters, oceans, and seas

Size: Head-tail length—right and bowhead whales up to 66 feet (20 m); pygmy right whale 7–21 feet (2–6.5 m)



Skin: Black with white patches; pygmy right whale gray, lighter below

Diet: Plankton and krill

Breeding: Reach adulthood at 6–9 years; 1 calf; calf separates from mother after 10–12 months

Life span: at least 65 years

Status: Northern right whale is endangered; bowhead whale—local populations are either critically endangered or endangered

RIGHT WHALES

whales in the area—especially if the ocean is noisy on the surface because there are a lot of people or boats moving around. Pygmy right whales do not jump around like their splashy, much larger right whale cousins.

Enormous Appetites

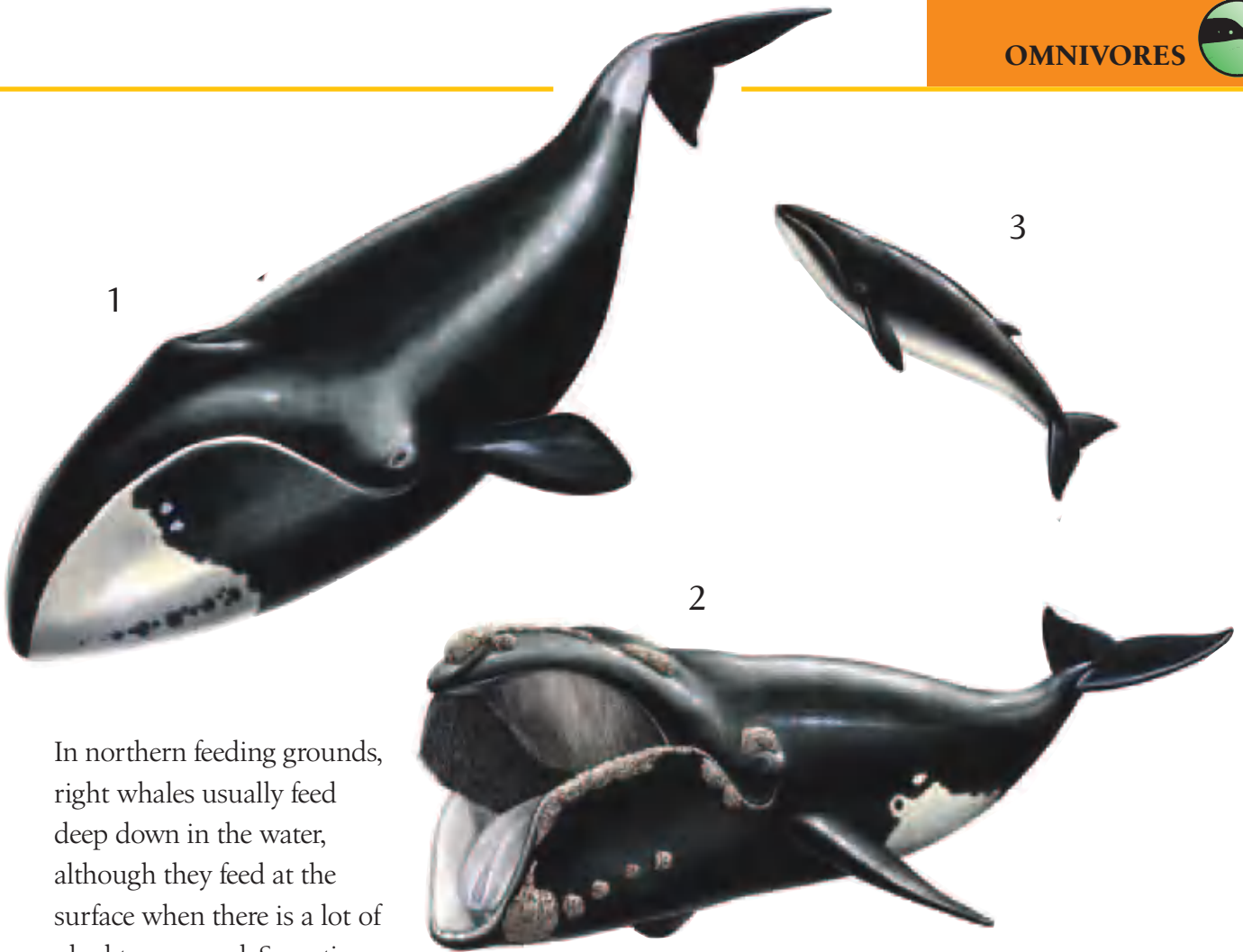
Right whales feed on tiny animals called plankton, which drift through the oceans. The whales usually swim along with their huge mouth open, skimming the plankton from the water using their baleen plates.

▶ *A southern right whale floats just below the surface of the ocean. Right whales are easy to hunt because they swim slowly.*



INUIT WHALE HUNTING

For thousands of years, the Inuits of Alaska have hunted bowhead whales, killing only a small number so that the overall whale population was not affected. However, American and European whaling companies killed too many whales in the nineteenth century. In 1915, the whaling companies stopped killing bowhead whales, but the Inuits still carried on with their hunting. In 1977, the International Whaling Commission recommended that the Inuits should also stop hunting bowheads. However, the Inuits argued that they needed to hunt whales for the survival of their people and to preserve their culture. Eventually, the Inuits were allowed to hunt small numbers of whales each year—and the numbers of bowheads are increasing, even with the Inuit harvest.







In northern feeding grounds, right whales usually feed deep down in the water, although they feed at the surface when there is a lot of plankton around. Sometimes, right whales feed side by side.

Mother and Baby

Female right whales give birth to one calf during the winter months. The calf grows inside its mother for around one year before it is born, and feeds on its mother's milk for at least another year. Mother and baby stay close together for the first six months of the calf's life. When the calf stops drinking its mother's milk, it usually leaves to start a life of its own.

DID YOU KNOW?

-  The head of a bowhead whale makes up 40 percent of its body length.
-  Right whales can dive underwater for eight to twelve minutes at a time.
-  Right whales and bowhead whales probably need to eat between 2,200 and 5,500 pounds of food every day.
-  A right whale calf is 26 to 30 feet long when it is only a year old!

1. *Bowhead whale*
2. *Northern right whale*
3. *Pygmy right whale*

RODENTS

Rodents include squirrels, beavers, porcupines, rats, mice, gerbils, hamsters, and guinea pigs. Most rodents are compact, intelligent mammals, with short legs and a tail. Their senses of smell and hearing are well developed, and they have long, touch-sensitive whiskers.

More than 42 percent of all mammal species are rodents. They live in almost every habitat, including people's homes, towns, and cities. Many rodents are crop pests and some spread diseases. However, they play a vital role in many habitats, both as prey for carnivores (meat eaters) and by spreading the spores of fungi that live on plant roots, helping plants absorb water and nutrients from the soil.

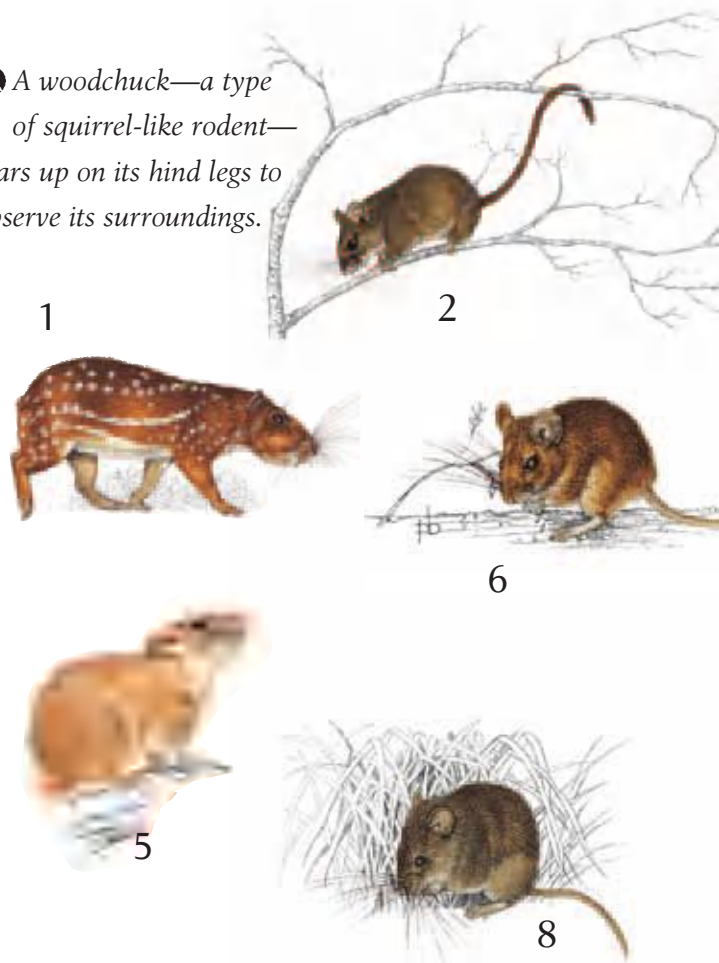
In South America, Africa, and Asia, people trap or breed some larger species of rodents for food, including guinea pigs, grasscutter rats, and edible dormice. People also keep many species of rodents as pets, including hamsters, gerbils, guinea pigs, rats, and mice. Guinea pigs, rats, and mice are also used to test drugs and in biological research.

Gnawing and Chewing

The name *rodent* comes from the Latin verb *rodere*, which means “to gnaw.” All rodents have razor-sharp, gnawing teeth at the front of the



▲ A woodchuck—a type of squirrel-like rodent—rears up on its hind legs to observe its surroundings.



mouth. These teeth grow continuously throughout life and are worn down as the rodents feed. With their gnawing teeth, rodents can make holes in tough husks, pods, and shells to reach the nutritious food inside. Rodents do not have pointed canine teeth, as do carnivores, but they do have a number of molars, or grinding cheek teeth. Most rodents have around twenty-two teeth, although the silvery mole rat of central and eastern Africa has twenty-eight.

Food and Feeding

Most rodents eat a variety of plants, including leaves and fruit, as well as grasshoppers and spiders. Many northern



Fact File

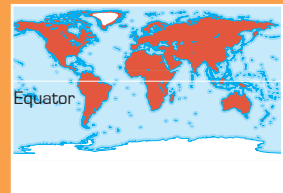
RODENTS

Order: Rodentia (around 2,000 species)

Families: 5 families of squirrel-like rodents (beavers, squirrels, and springhares); 5 families of mouselike rodents (rats, mice, voles, gerbils, and hamsters); 18 families of cavylike rodents (porcupines, cavies, capybaras, agoutis, chinchillas, cane rats, and mole rats)

Where do they live? Worldwide, except in Antarctica

Habitat: Arctic tundra, forests, grasslands, deserts, freshwater, and underground



Size: Head-tail length 6 inches–5 feet (15 cm–1.5 m); weight usually 3.5 ounces (100 g) or less; capybaras up to 146 pounds (66 kg)

Coat: Brown or gray on back; often lighter, or white, underneath

Diet: Mostly plants and small invertebrates; some eat small fish, frogs, and shellfish






Breeding: Mature at 6 weeks; many litters a year, each with 2–12 babies

Life span: A few years in the wild, and up to 20 years in zoos

Status: 78 species critically endangered; 100 species endangered; 200 species vulnerable

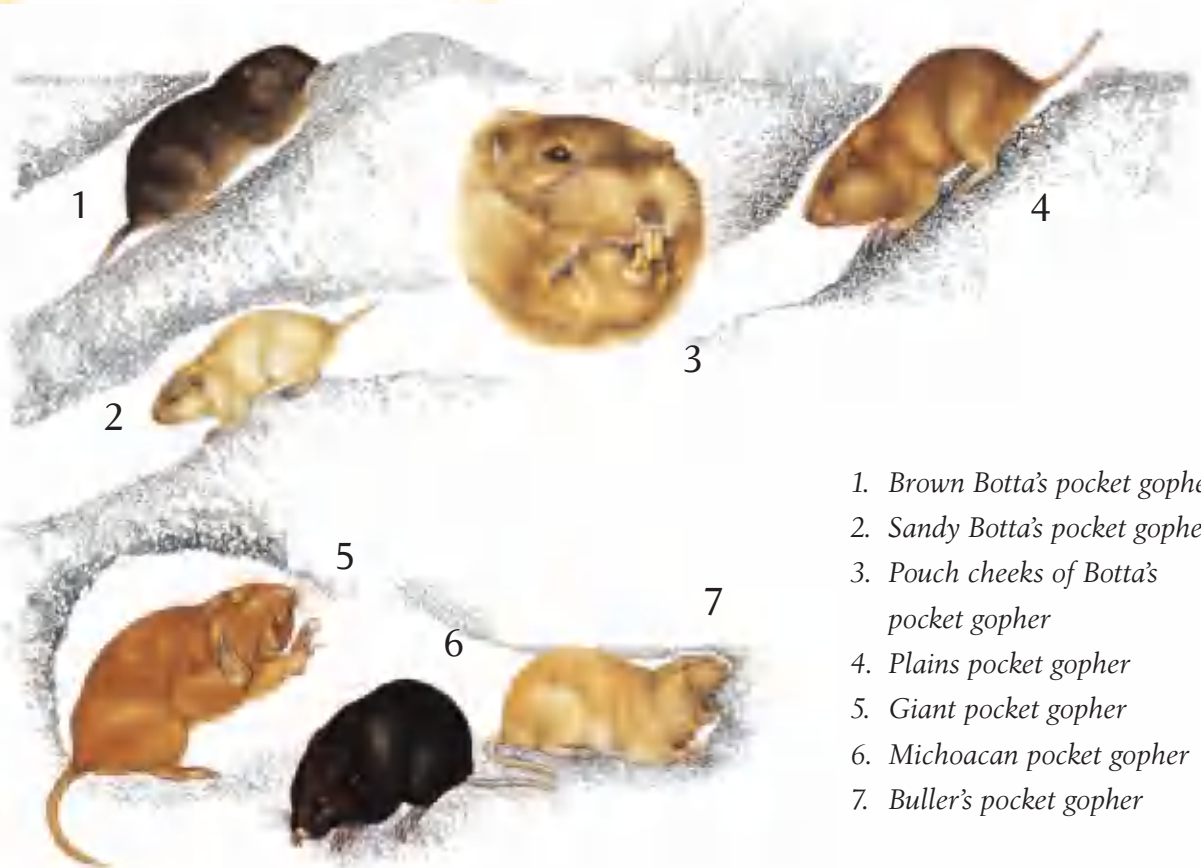
- | | |
|--------------------------------|----------------------------------|
| 1. Paca | 6. Deer mouse |
| 2. South American climbing rat | 7. Central American climbing rat |
| 3. Vesper rat | 8. Pygmy mouse |
| 4. Dormouse | 9. Short-eared gerbil |
| 5. North African gundi | 10. Pack rat, or wood rat |

DID YOU KNOW?

-  The largest rodent, the capybara, can weigh 10,000 times more than the smallest mouse!
-  Gundis never drink—they get all the water they need from their body fat.
-  The Australian water rat has only twelve teeth, compared with an adult human's thirty-two teeth.
-  Common hamsters might store up to 198 pounds of food!
-  The naked mole rats of East Africa are relatives of guinea pigs. Naked mole rats have hardly any hair and spend almost all their time living in large colonies in underground burrows.

rodents, such as the field vole, eat the bark of woody trees when food is hard to find during the long winters. A few rodents are carnivores. The Australian water rat, for example, feeds on small fish, frogs, and shellfish.

To help them digest tough plant material, especially cellulose, rodents have a large appendix in their gut. This small pocket contains lots of bacteria (single-celled microorganisms). The bacteria break down plant cellulose. Rodents can absorb cellulose only through the walls of their stomach. So, they pass the digested food out of the body in



1. *Brown Botta's pocket gopher*
2. *Sandy Botta's pocket gopher*
3. *Pouch cheeks of Botta's pocket gopher*
4. *Plains pocket gopher*
5. *Giant pocket gopher*
6. *Michoacan pocket gopher*
7. *Buller's pocket gopher*

the form of pellets and then eat the pellets. When the pellets reach the stomach, the goodness from the food can be absorbed into the rodent's bloodstream. A rodent's digestive

system is efficient, absorbing as much as 80 percent of the energy contained in its food.

At least three families of rodents (hamsters, pocket gophers, and pocket mice) have cheek



THE GUINEA PIG GROUP

The familiar guinea pig belongs to a large group of cavylike rodents, which includes porcupines, pacas, agoutis, cane rats, spiny rats, coypus, gundis, and mole rats. The largest rodent of all, the capybara, is also a member of the guinea pig group. Most of these rodents have a large head, a plump body, slender legs, and a short tail. All cavylike rodents share the same type of jaw muscles. They also produce small litters of babies after a long

gestation (pregnancy). Guinea pigs, for example, have two or three babies after a gestation of fifty to seventy days. The brown rat, however, has seven or eight offspring after a gestation of around twenty-four days. Brown rats are members of the mouselike rodent group. At birth, guinea pig babies are covered in fur and their eyes and ears are open. They can run around within an hour of birth and eat solid food after two days.



pouches for carrying food back to the nest. These pouches are fur-lined folds of skin, which curl inward from the corner of the mouth.

Rodent Communication

Rodents use their keen senses of sight, sound, and smell to communicate with others of their own species. House mice have a complex system of scent communication, using urine to scent-mark their home area. That helps them recognize family members and find a mate. Many other rodents communicate with scent,

▲ *A capybara nurses her offspring. Capybaras are the largest rodents, at around 4 feet long.*

and males tend to produce more, and stronger, scent than female rodents.

In contrast, kangaroo rats tap dance to talk to each other. They thump their long feet on the ground to tell other kangaroo rats that they live in that particular area and that they should be left alone. This sort of communication is useful because these rodents come out at night and live underground, which makes visual





communication difficult. Tree squirrels come out during the day, so they use visual communication, such as tail flicking, to pass messages to other squirrels. Squirrels and many other rodents also use a wide variety of calls to tell neighbors to stay away or to sound the alarm if one of them spots danger.


Rodents and Conservation

Unlike house mice and brown rats, not all rodents have thrived with the spread of people around the world. Some rodents are shy and difficult to study in the wild, making it hard to estimate their numbers. At least fifty-four rodent species have died out in the last 200 years. Around 380 species now face extinction. For some, such as Margaret's kangaroo rat and the Brazilian arboreal mouse, habitat protection may provide a chance of survival.

People are also trying to save some endangered rodent species by programs of captive breeding and habitat management. For example, in 1990 there were fewer than 1,500 greater stick-nest rats living on Franklin Island off the southern coast of Australia. So, experts moved captive-bred greater stick-nest rats to three new islands and to enclosures on the Australian mainland. That move allowed numbers of these rodents to double within nine years. Similar conservation programs have also helped other endangered rodent species, such as Vancouver marmots and Shark Bay mice.

DID YOU KNOW?

-  Prairie dog townships may contain more than 5,000 individuals!
-  One pair of mice could produce 500 mice in twenty-one weeks! That does not happen, however, because many baby mice do not survive.
-  Every year, rodents eat as much food as the world's total cereal and potato harvests!
-  Rats can gnaw through electrical cables, causing fires!

 *A chipmunk with bulging cheek pouches holds some food between its front paws while it eats. Chipmunks are squirrel-like rodents.*



RORQUALS

Rorqual whales include the largest animal in the world, the blue whale, as well as the acrobatic humpback whale, which is famous for the males' long, complex songs.





Rorquals include blue whales, fin whales, sei whales, minkes, and humpback whales. *Rorqual* means “furrow whale” in Norwegian. These whales are named for their furrowlike throat grooves, which allow them to expand their mouth when feeding. Rorquals have a sleek, streamlined shape, with a large head that takes up about one-quarter of their body length. The lower jaw is bowed and sticks out beyond the end of the snout. The flippers are thin and narrow in all species except the humpback whale, which has large, wavy-edged flippers at the front. A rorqual’s wide tail flukes have an obvious notch in the middle.

Like all whales, rorquals have to come to the surface of the ocean to breathe air. Rorquals have a double blowhole on top of the head. As they breathe out, they create a single spout of misty air, the height and shape of which varies between species.

Great Migrations

The life cycle of rorquals is closely related to their pattern of seasonal migrations, or regular journeys. During winter, these whales mate in warmer waters nearer to the equator. Then they migrate to feeding areas in the colder oceans around the poles, where they spend three to four months feeding on plankton (tiny animal and plantlike life in the ocean) and fish. After that, rorquals journey back to the warmer waters once more, where the females give birth to one calf each time.

Air bubbles escape from a blue whale’s mouth as it swims along. Clearly visible are the throat grooves, which allow the whale to open its mouth very wide.

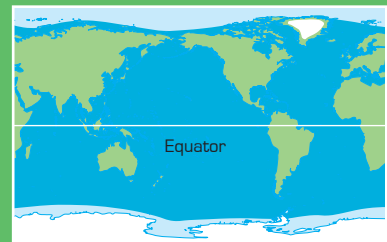
Fact File

RORQUALS

Family: Balaenopteridae (9 species)

Order: Cetacea

Where do they live? All major oceans



Habitat: Most species migrate between summer feeding grounds in polar regions and winter breeding grounds in warmer waters

Size: Head-tail

length 30–90

feet (9–27 m);

weight 10–167

tons (9–150 metric tons); females slightly larger than males



Coat: Black or gray above, often lighter on belly and lower surface of flippers

Diet: Plankton and fish

Breeding: One calf born 10–12 months after mating; usually two years between pregnancies

Life span: 45–100 years

Status: Blue whales, fin whales, and sei whales are endangered; humpback whales are vulnerable; minke whales are lower risk

RORQUALS

Feeding Time for Calves

The mother whale squirts rich milk into the mouth of her calf. Her milk has a fat content of up to 46 percent, compared with only 3 to 5 percent fat in human milk or cows' milk.

The rorqual calf grows quickly on this high-energy diet, gaining as much as 200 pounds in a day.

When it is around seven or eight months old, the calf stops drinking its mother's milk. At this stage, it is around 33 feet long.

Conservation

The future of these whales now depends on conservation measures taken in recent years to protect them from overhunting. Many rorqual

DID YOU KNOW?



The giant blue whale is the largest mammal that has ever lived. It weighs up to 167 tons, the weight of twenty-five 7-ton male African elephants. A female blue whale may be 110 feet long, which is larger than the male!



A large blue whale weighing 111 tons has to eat 4.5 tons of krill (tiny shrimplike animals) every day during the summer feeding season.



A newborn rorqual calf is about one-third of its mother's length, and 4–5 percent of her weight.

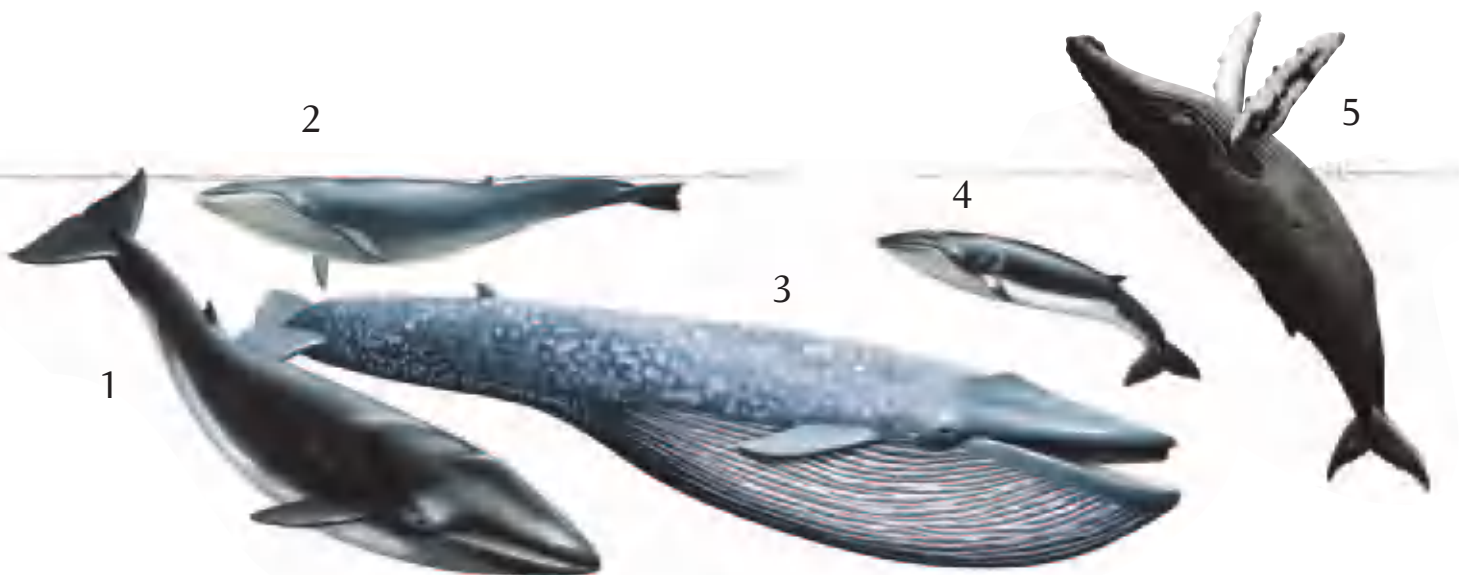


Rorquals travel thousands of miles on their migration journeys between their breeding and feeding grounds.



Male humpback whales may sing for more than twenty-four hours to attract females.

1. *Fin whale*
2. *Eden's whale*
3. *Blue whale*
4. *Northern minke whale*
5. *Humpback whale*





BIG APPETITES, SMALL PREY

Rorquals sieve plankton from seawater using fringed plates of baleen hanging from the roof of their mouth (see right). The whale opens its mouth wide and lets the water flow through the plates, which trap tiny pieces of food for the whale to swallow. Sei whales also feed by skimming through the water with their mouth half open. When enough food has been collected, the whale closes its mouth and swallows the food.

The shapes and sizes of the baleen plates and the texture of the bristly fringes vary among the different species of rorquals. This affects the type of food the different whales eat. Blue whales feed mainly on shrimplike food, especially krill, while minke, humpback, and Bryde's whales eat a lot of fish, such as herring, cod, and sardines. Minke whales circle schools of

fish and then shoot straight up through the water with their mouth open to grab a meal. Humpback whales may also herd their prey by releasing a circle of bubbles, which work rather like a fishing net to prevent the fish from escaping.



species, including blue whales, are endangered; it will take a long time for their numbers to increase because these huge whales breed extremely slowly. Their gestation lasts up to twelve months, and there are usually two years between pregnancies.

Meanwhile, rorquals have to survive changes in the oceans brought about by climate change and pollution,

including noise pollution from ships. Changes in ocean temperatures, as a result of climate change, and holes in the ozone layer may both affect the food on which these great whales depend. Rorquals also drown if they become trapped in fishing gear.

Colliding with ships is becoming more of a hazard for these whales as the number of ships increases.

SEALS AND SEA LIONS

Seals, sea lions, and walruses belong to a group of mammals called pinnipeds, which means “fin-footed” or “web-footed.” All pinnipeds have webbed flippers and a streamlined body that is shaped like a torpedo and helps them swim fast. Although they spend much of their life in the water, seals and walruses must return to land or ice to give birth to their pups.

There are two main groups of seals—true seals and eared seals. Eared seals include fur seals and sea lions. True seals use their back flippers to swim through the water, while eared seals use their front flippers. Eared seals can bring their back flippers forward and under their body to walk on land. True seals cannot

1. *Male California sea lion*
2. *Female Steller sea lion*
3. *Male New Zealand sea lion*
4. *Male northern fur seal*
5. *Female South American fur seal*
6. *Female South American sea lion*





▲ *A sea lion roars to protect its territory from a neighbor that has moved too close.*

do that, so they have to drag themselves along on their belly when they move on land.

Eared seals have a flap of skin near their ear opening, which looks like an ear. True seals do not have any ears on the outside of the head. However, they do have a thick layer of fatty blubber under the skin, which traps heat and keeps them warm in cold oceans. Eared seals have less blubber, but many have thick, woolly underfur, with long, stiff, waterproofing guard hairs on top. Fur seals have thick underfur, although sea lions have only a thin covering.

From Land to Sea

Seal ancestors first evolved on land. They gradually evolved features that allowed them to feed and live for long periods in cold oceans, where there is plenty of food.

Fact File

SEALS AND SEA LIONS

Families: Phocidae (19 species of true seals);
Otariidae (16 species of eared seals)

Order: Carnivora

Where do they live?

Polar, subpolar,
and temperate
oceans, islands
around



Antarctica,
Galápagos Islands, Hawaiian Islands, and the
Mediterranean Sea

Habitat: Coastlines and ice in polar regions, coastal rocks and islands, beaches, estuaries, and freshwater rivers

Size: Head-tail length 3.9–13.8 feet (1.2–4.2 m);
weight 66–4,850 pounds (30–2,200 kg)

Coat: Some have spots or bands; eared seals have underfur, true seals do not

Diet: Fish, shellfish, squid, krill, and rock lobsters; sometimes penguins and other seals

Breeding: 1 pup (rarely twins); weaning varies according to species, from a few days to three years; usually independent after feeding stops

Life span: 20–46 years






Status: Mediterranean monk seal is critically endangered; Hawaiian monk seal and Steller sea lion are endangered; Caspian seal, northern fur seal, Guadalupe fur seal, Juan Fernandez fur seal, Galápagos fur seal, Galápagos sea lion, and New Zealand sea lion are vulnerable

Seals have large eyes that work both in air and water and can withstand a range of light levels, from bright sunshine to the darkness of the deep ocean. Seals see well in


SEALS AND SEA LIONS

dim light; they have a reflective layer behind the eye that directs light back into the eye. So, the light has two chances of being detected by the sensitive cells at the back of the seal's eyes. The large lens inside the eye is sphere shaped, like a fish's eye, which helps a seal's eyes focus clearly underwater.

DID YOU KNOW?

-  Elephant seals can stay underwater for up to two hours, allowing them to catch fish at depths of around a mile!
-  Male southern elephant seals may weigh more than 4.5 tons!
-  Hooded seal pups drink their mother's milk for only four days but double their birth weight in that short time! The milk contains 60 percent fat, which is more fat than mother's milk in any other mammal.
-  South American fur seals suckle for up to two years.
-  Northern elephant seals sleep in the water. They survive for up to twenty-five minutes without breathing when they are asleep underwater!

A seal's ears work better in water than in air. On land, a seal's hearing is similar to that of a person's. Underwater, however, a seal's hearing is much better than a person's, and seals can hear much higher sounds than people can. A seal's ears are positioned on either side of the head, just as a human's ears are, making it easier for a seal to figure out the direction of sounds. Seals have well-developed whiskers, called vibrissae, on either side of the nose. These whiskers help seals detect the water movements caused by prey, especially in dark or murky water. The whiskers also help some seals find their breathing holes when swimming under

 *On the hunt for fish, a gray seal dives to the seafloor. These true seals feed mainly on bottom-dwelling fish, although they also eat crabs.*



THE RAREST SEALS

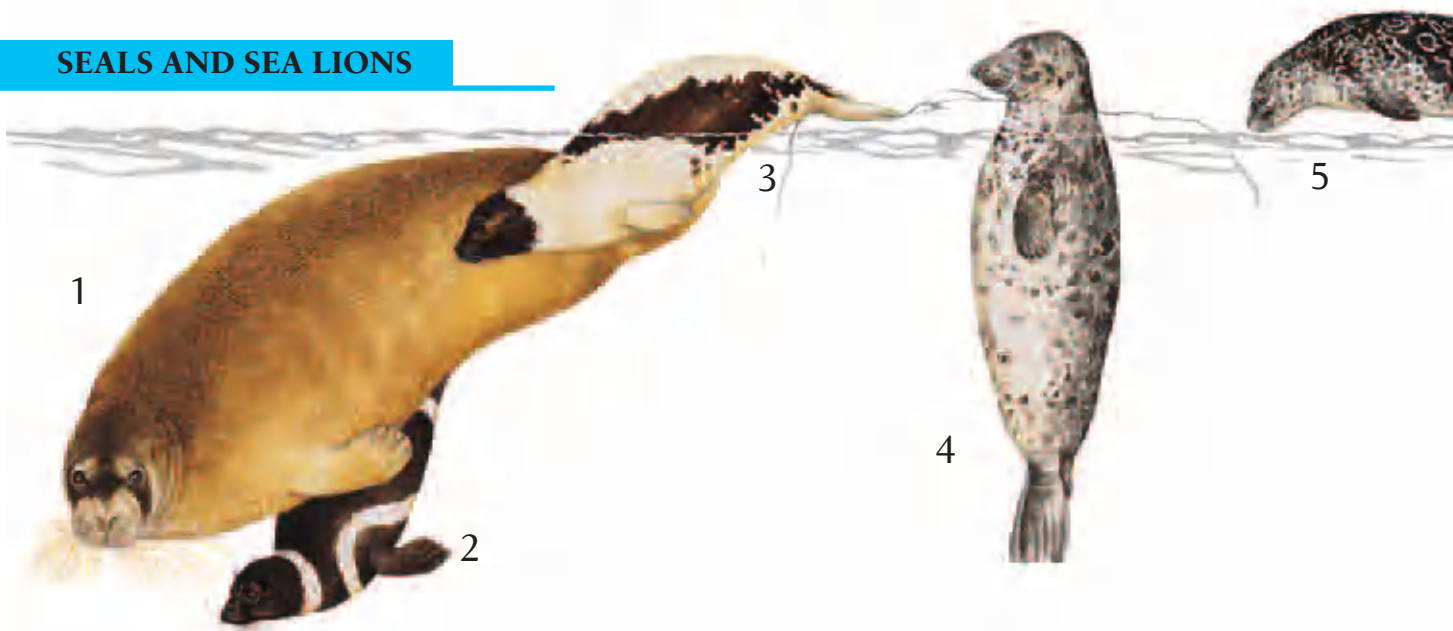
One of the three species of monk seals, the Caribbean monk seal is probably already extinct, and the other two species are rare. There are around 1,300 Hawaiian monk seals left, but fewer than 500 Mediterranean monk seals (right). Monk seals are sensitive to disturbance by tourists using the beaches where the seals give birth. Mediterranean monk seals now give birth mainly in caves, which can collapse on top of them and crush them. Although they are now protected throughout most of their range, these seals are still killed by fishers, who think the seals compete for the fish they catch. Many seals are accidentally trapped in fishing gear and drown underwater.



the ice and are used to investigate objects or other animals on land. During fights with other seals, a seal often pulls its whiskers forward and holds them upright, as an aggressive signal. The sense of smell is less important to seals than their other senses, and seals keep their nostrils tightly closed underwater. However, some seals, such as harp seals, recognize their pups mainly by smell.

🕒 *A harp seal pup has white fur that helps camouflage it. Harp seals are named for the harp-shaped markings on the back of the adult.*

SEALS AND SEA LIONS



Fishy Food

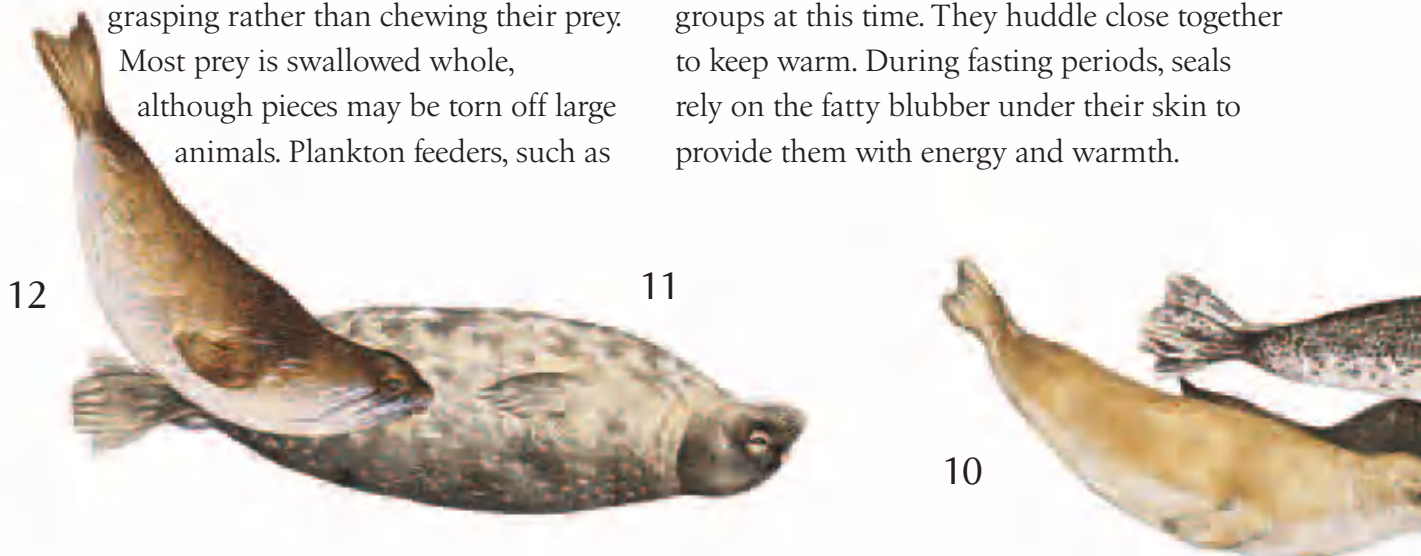
Many seals eat a variety of prey, especially fish. Seals come to the surface to eat large prey but eat smaller prey underwater. The southern elephant seal and the Ross seal feed mainly on squid, while the bearded seal eats mainly clams. A few seal species eat birds and small mammals. Many sea lions eat birds, while some prey on seal pups.

The jaws and teeth of seals are suited to grasping rather than chewing their prey.

Most prey is swallowed whole, although pieces may be torn off large animals. Plankton feeders, such as

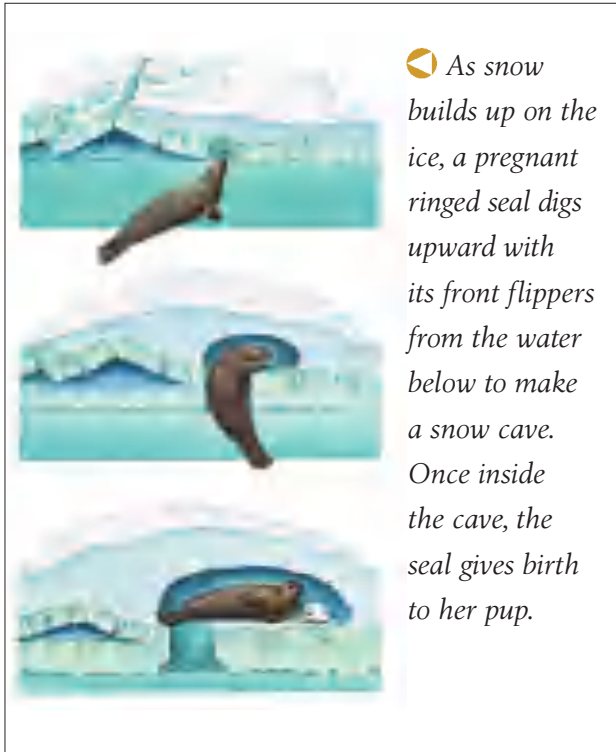
crabeater seals have cusps (jagged points) on the surface of their cheek teeth. The cusps help the seals strain food from the water. Plankton is tiny animal and plantlike life in the ocean.

Most seals eat a great deal of food at some times of the year and little food at other times. Seals may fast for a long time while they are breeding or molting (shedding) their fur. Seals usually stay out of the water during molting periods, and some species gather in large groups at this time. They huddle close together to keep warm. During fasting periods, seals rely on the fatty blubber under their skin to provide them with energy and warmth.





1. Bearded seal
2. Ribbon seal
3. Harp seal
4. Gray seal
5. Ringed seal
6. Hooded seal
7. Hawaiian monk seal
8. Southern elephant seal
9. Leopard seal
10. Crabeater seal
11. Weddell seal
12. Ross seal



As snow builds up on the ice, a pregnant ringed seal digs upward with its front flippers from the water below to make a snow cave. Once inside the cave, the seal gives birth to her pup.

SNOW-CAVE HIDEAWAYS

Female ringed seals make snow caves to shelter their newborn pups from freezing arctic temperatures. The mother seals use their front flippers to dig upward into the snow above their breathing holes, creating a shallow cave in the snow. These snow caves help keep the pups warm but also hide them from predators, such as polar bears and arctic foxes. The pups are born in the cave and spend their first one or two months living there.

Birth and Babies

Seals come ashore to give birth in spring or early summer. Most true seals breed on sea ice, although monk seals, elephant seals, harbor seals, and most gray seal populations are exceptions. Not a great deal is known about the behavior of ice-breeding seals.

Eared seals do not breed on ice. Instead, they choose safe beaches, rocky islands, and other coastal places where they are safe from predators. The males arrive first and claim a patch of ground, called a territory. They defend this territory from other males, often fighting fiercely. The females come ashore just before

🦁 *The male northern elephant seal is much larger than the female. In addition, the male has an inflatable trunklike snout, or proboscis, from which the species gets its name.*

DID YOU KNOW?

- 🐾 Male northern fur seals are up to five times heavier than females!
- 🐾 Male New Zealand fur seals fast for seventy days during the breeding season while they are defending groups of females from other males.
- 🐾 The Antarctic fur seal has recovered from near extinction to a population of 700,000 to one million. The northern elephant seal has also recovered from fewer than 100 to more than 150,000 individuals!
- 🐾 Leopard seals are fierce hunters that even eat other seals, such as crabeaters, fur seals, and elephant seal pups.



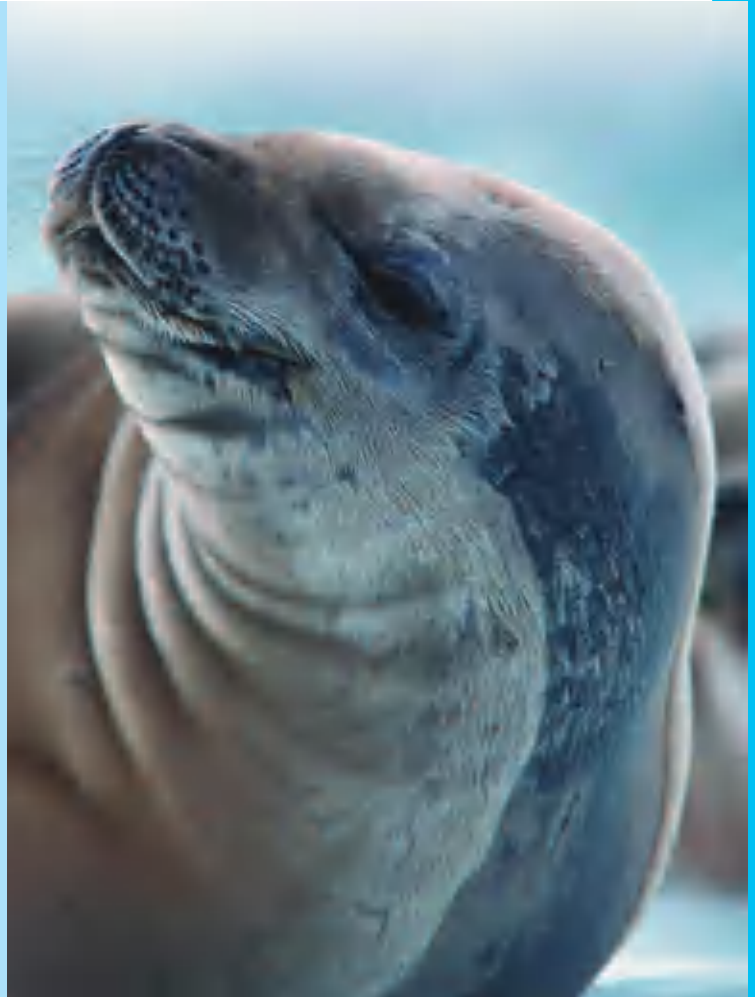
giving birth to a single pup.

They mate again soon after the birth, but do not give birth to another pup until the following year.

The newborn pups of most seals are usually covered with a woolly birth coat. Most true seal pups molt this coat after two to three weeks, while eared seal pups usually take two or three months to do so. True seal mothers feed their pups on their rich milk for days or weeks, while eared seal mothers suckle their pups for several months or even years. Some seals stay near their breeding grounds throughout the year, but most swim off into the oceans after the

CRABEATER SEALS

Crabeater seals have a misleading name because they do not eat crabs. Instead, they filter shrimplike krill from the seawater of the Antarctic Ocean, forcing the water through spaces in their cheek teeth. These unusual seals rest on floating slabs of ice, which helps them escape predators and may also help them save energy in water that is always close to freezing. After humans, crabeater seals are probably the most common large mammals in the world. There are between seven and fourteen million crabeater seals in the Antarctic. They may have increased in numbers when people killed off so many of the great whales, which eat the same food as crabeater seals. That left more food for the seals. If the numbers of whales increase in the future, then seal numbers are likely to be reduced.



breeding season. There, they eat as much as possible to build up enough fat reserves to last them through the next breeding season.

Seals and People

Many seal species were once hunted almost to extinction for their fur coat or for the oil in their blubber. Most species are now protected, and only a few species, such as monk seals and

Steller sea lions, are rare or endangered. However, competition with fishers, accidental trapping in fishing gear, pollution, and climate change are still threats to many seal populations. Seals are also still killed for food and for their skins by arctic people in northern regions and by coastal people elsewhere. This hunting has been going on for thousands of years and has little impact on seal numbers.

SHREWS

Small, secretive mammals, shrews can be recognized by their long, pointed nose. They usually live on the ground, but some shrews can climb trees, others live underground, while several species live partly in water.





Shrews are widespread and numerous mammals that have lived on Earth for around forty-five million years. The smallest mammal on land is the pygmy white-toothed shrew, which is 1.4 inches long—a similar size to the tiniest bat or hummingbird. Shrews have poor eyesight but keen senses of smell and hearing. They make high-pitched screams and twitterings when fighting with members of their own species. Some species of shrews have a poisonous bite, which kills or paralyzes their prey. The American short-tailed shrew produces enough poison to kill around 200 mice. Species that live partly in water may have webbed feet or fringes of hairs on their feet, toes, and tail. The hairs also trap air, allowing the shrews to run on the surface of water. The hairy feet of the piebald shrew help it run across sand without sinking.

Active Eaters at Risk

Shrews are extremely active and eat a lot of food (for their size) just to keep their body going. Some shrews cannot survive more than an hour or two without food because their body burns food so quickly. Other shrews, such as the desert shrew, save energy by going into a deep sleep, called torpor, at times of the day when they cannot find enough food. House shrews have adapted well to living with people. Many shrews, however, are endangered by the destruction of tropical forests and are likely to die out in the near future.

A white-toothed shrew feasts on a juicy earthworm. Although these shrews are tiny, they are determined and fierce predators that hunt a great deal of prey.

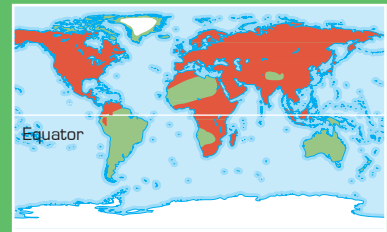
Fact File

SHREWS

Family: Soricidae (384 species)

Order: Eulipotyphla

Where do they live? Eurasia, Africa, North America, and northern South America



Habitat: Forests, woodlands, grasslands, and deserts; some species live partly in water

Size: Head-body length 1.4–5.9 inches (3.5–15 cm); weight 0.07–3.7 ounces (2–106 g)



Coat: Short, thick fur; mostly gray or brown

Diet: Seeds, nuts, and other plant material; also earthworms, lizards, newts, frogs, and fish

Breeding: 2–11 naked and blind offspring at a time; several litters each year

Life span: 12–30 months

Status: 31 species are critically endangered; 36 species are endangered; 58 species are vulnerable



SKUNKS AND STINK BADGERS

Skunks and stink badgers are well known for spraying their enemies with foul-smelling liquids. They are among the few mammals that rely on chemicals to defend themselves. Their black-and-white stripes and spots warn predators to stay away.





When threatened, skunks and stink badgers raise their tail, stamp their feet, hiss, and even do handstands—all to give their enemies time to change their mind. If the enemy does not go away, the skunk lets fly with a jet of irritating musk, a liquid that causes temporary blindness. The skunk stores enough musk for five or six shots. The Palawan stink badger even tries playing dead at first before spraying because predators prefer to eat live prey and may decide to leave the stink badger alone if it appears to be dead.

Skunks and stink badgers both have long claws and are good at digging and burrowing. They dig burrows in which to rest, sleep through the winter, give birth, and raise their offspring. They also dig for food, such as insects and rodents, finding their prey by sound or smell since they have poor eyesight.

Family Life and Human Threats

Skunks live on their own for most of the year. In colder northern lands, up to twenty individuals may sleep in a den for up to six months. These skunks are born in spring and mature by the end of the summer. Males do not care for young skunks and may even kill them, so mothers have to defend their offspring against males.

People probably kill around half of all the skunks born each year, either by shooting them, poisoning them, or running them over on roads. Predators, such as coyotes, dogs, foxes, and owls rarely kill skunks.

A striped skunk looks for food. Striped skunks are the commonest species and often live in cities and surrounding areas, either in dens or under buildings.

Fact File

SKUNKS

Family: Mephitidae (12 species)

Order: Carnivora

Where do they live? North, including Central, and South America



Habitat: Varied, including fields, woods, urban areas, rocky canyons, and deserts

Size: Head-tail length 12–27 inches (31–68 cm); weight 1–13 pounds (0.5–6 kg)



Coat: Black, with white stripes or spots

Diet: Mainly insects and rodents; also frogs, salamanders, snakes, birds' eggs, and human garbage

Breeding: 2–9 offspring; independent after around three months

Life span: Usually less than 3 years

Status: Palawan stink badger of Southeast Asia is vulnerable



SLOTHS

Sloths are the slowest mammals in the world. They eat plants and are the most numerous large mammals in Central America and tropical South America. They are well suited to a life hanging upside down from tree branches by their hooked claws.





Sloths have a rounded head and a flattened face, with small ears hidden among the fur on the sides of the face. They have a short, fine underfur and an overcoat of longer and coarser hairs. The overcoat hairs grow as long as 6 inches on two-toed sloths. A sloth's overcoat turns green in moist conditions because tiny plantlike algae grow on the hairs. The green color helps camouflage sloths among the leaves of their forest home. Moths, ticks, and beetles also live in a sloth's fur. There are two families of sloths, which can be told apart by the number of fingers on each front paw. Two-toed sloths have two fingers, and three-toed sloths have three fingers. Both families have three toes on each hind foot. All species of sloths live in exposed treetops and regulate their body temperature by moving in and out of the sunlight.

Eating Greens

Sloths eat mainly the leaves—especially the young leaves—of a small number of plants and trees. They may be resistant to the poisons produced by certain plants for defense, and so eat mainly those plants. A sloth's body works extremely slowly, which may allow its gut to cancel out the plant poisons so the sloths are not harmed. A sloth's leafy diet does not provide much energy. All sloths have a large stomach with several chambers that contain bacteria (single-celled microorganisms). These bacteria help the sloth digest

A two-toed sloth uses its strong claws to hang from the branches. Sloths spend much of their time upside down, even sleeping and giving birth in this position.

Fact File

SLOTHS

Families: Megalonychidae (2 species of two-toed sloths); Bradypodidae (4 species of three-toed sloths)

Order: Pilosa

Where do they live? Central and South America



Habitat: Tropical forests; mountain forests (Hoffmann's two-toed sloth only)

Size: Head-body length 22–28 inches (56–70 cm); weight 7.7–17.6 pounds (3.5–8 kg)



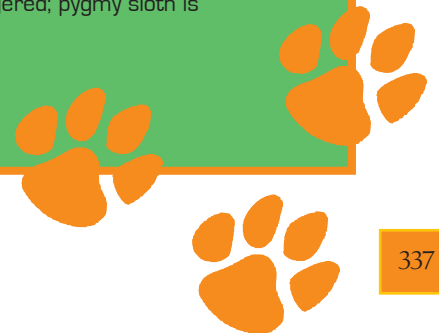
Coat: Grayish brown to greenish beige; dark on face and neck, lighter on shoulders

Diet: Mainly tree and liana leaves

Breeding: Reach adulthood at 3–5 years; 1 offspring; remains with mother for 5–9 months

Life span: 12 years in the wild, and up to 31 years in zoos

Status: Maned three-toed sloth is endangered; pygmy sloth is vulnerable



SLOTHS

tough plant cellulose. Meals may stay in a sloth's stomach for more than a month as they are slowly digested to release the nutrients. A full stomach might account for almost one-third of a sloth's body weight.

Mothers and Babies

Sloths usually breed throughout the year, but in Guyana in South America, births of the pale-throated three-toed sloth occur only after the rainy season. Only one sloth baby is born at a time. It weighs 10.5 to 14 ounces and is helped to a teat by the mother. All young sloths stop suckling their mother's milk when they are around four weeks old, but they may start to eat leaves before that time.

The mother sloth carries her baby around for five to nine months, and the young sloth feeds on the leaves it can reach while clinging to its mother. If separated from its mother, the young sloth bleats or whistles. When a young sloth stops feeding from its mother, it moves off to a nearby area and begins eating the same sort of leaves that the mother eats. Adult sloths live on their own. Females mature at around three years old and males at five years.



HANGING AROUND

Sloths do not move very fast or very far. Their body temperature is low and varies between 86 and 93°F. Having a variable body temperature enables sloths to save energy; their metabolic rate is less than half of that expected for their body weight. Their leafy diet is low in energy. Sloths also have reduced muscles—around half the relative weight for most land-living mammals—and they cannot afford to keep warm by shivering because that uses up too much energy. Instead, they move into or out of the sunlight to regulate their body temperature. Most three-toed sloths do not move farther than 125 feet in a day.



▲ *Clinging on tightly with all four limbs, a brown-throated three-toed sloth occupies a favorite tree.*




Male sloths may advertise for females by smearing scent messages on tree branches from their anal gland.

The Future of the Forests

Large numbers of sloths, especially two-toed sloths, are hunted for their meat in many parts of South America. Some sloths are taken away from the forests into the cities, where tourists pay to have their photographs taken with these unusual mammals. The maned three-toed sloth is endangered due to the destruction of its coastal rain forest habitat. The pygmy three-toed sloth is classed as vulnerable;

it is likely to be at risk of extinction in the future if current trends continue. The future of all six species of sloths depends on the future of the rain forests. If the sloths have no forests to live in, they will die out.

DID YOU KNOW?

-  Sloths urinate and produce droppings only once or twice a week, at which time they climb down from the trees.
-  A sloth's huge, hooked claws are around 3–4 inches long!
-  The two-toed sloth is active for only seven hours in every twenty-four hours.

SPERM WHALES

The largest of the toothed whales, a sperm whale has the largest brain on Earth and probably dives deeper in the oceans than any other animal. This group also includes the far smaller dwarf and pygmy sperm whales.





There are three species of sperm whales. The largest sperm whale has been living on Earth for around thirty million years. Pygmy sperm whales and dwarf sperm whales evolved much later, around eight million years ago. All three species have a barrel-shaped head, a long, narrow bottom jaw with teeth, paddle-shaped flippers, and a blowhole (breathing hole) on the left side of the head. Between dives, the whales come to the surface to breathe air around every eight minutes. Two nasal passages lead from the blowhole; one is used for breathing, while the other produces sound.

Dwarf and pygmy sperm whales spend a great deal of time lying quietly on the ocean surface with their tail hanging down. They are timid and slow moving. When threatened, these whales produce a reddish brown liquid, which may help them escape predators such as large sharks or killer whales.

Whale Talk

Inside the larger sperm whale's forehead is a structure containing a sticky, waxy oil called spermaceti. The structure containing the spermaceti, and the air sacs and air passages around it, form a powerful sonar, or echolocation, system. The whale produces clicking sounds and picks up echoes from its surroundings. That helps it find food in the ocean depths. The whale also uses clicks to communicate with other whales. A

An enormous sperm whale makes its way through the ocean waters. Its barrel-shaped head and long, narrow bottom jaw and teeth are clearly visible.

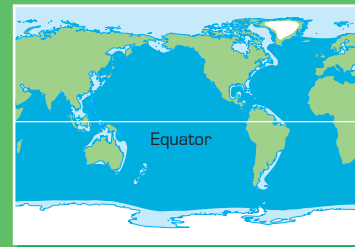
Fact File

SPERM WHALES

Families: Physeteridae (1 species);
Kogiidae (2 species)

Order: Cetacea

Where do they live? Worldwide, except extreme arctic and antarctic waters; mature male sperm whales to edge of polar ice



Habitat: Mainly deep oceans; younger whales inhabit shallower inshore waters

Size: Head-tail length
7–52.5 feet (2.1–16 m);
weight 300 pounds–63
tons (136 kg–57 metric tons)



Coat: Gray on back; white or pinkish on the belly

Diet: Squid, octopus, fish, and crabs

Breeding: Reach adulthood at around 30 years; 1 calf; males independent at 6 years; females stay in family group

Life span: From 17 years (pygmy sperm whale) to at least 60–70 years (sperm whale)

Status: Sperm whale is vulnerable; pygmy and dwarf sperm whales are probably rare

SPERM WHALES

large male makes slow, ringing clicks around once every six seconds. These clicks may help him attract a female, tell other males to keep away, or show off his fitness and size.

Males and Females

Little is known about the reproduction of pygmy and dwarf sperm whales. In the larger sperm

whale, males are much bigger than females and grow until they are around fifty years old. The largest males swim close to the edge of the Arctic and Antarctic. They journey to warmer waters nearer the equator to find females for mating. Breeding males usually avoid one another, but sometimes rival males fight using their teeth.

▶ *A group of pygmy sperm whales swims together. The adults stay close to the calves to protect them from predators, such as killer whales.*



GROUP PROTECTION

Female sperm whales gather in family groups of around twelve often closely related individuals, such as these pygmy sperm whales (above). That allows young calves to be protected by some of the adults on the surface while their mothers dive into the depths of the sea to feed. Adults also protect each other from predators. Sperm whales sometimes surround an injured whale, forming a shape like the petals of a flower, with their head or tail in the center. They can then defend the injured whale using their teeth or powerful tail.



Family Units and Bachelors

Male sperm whales leave the family units, which are made up of several mothers and their calves, when they are around six years old. They join other young males to form bachelor schools. As they grow older, males are more likely to live alone. In contrast, male dwarf sperm whales may live in groups with females and their calves. In addition, groups of young whales also form. Groups of dwarf sperm whales may number up to ten individuals, while pygmy sperm whales either live alone or in groups of up to six whales.

The Human Threat

Around 300 years ago, there were more than a million sperm whales. There are now only around 360,000 left, and they are in danger of extinction. Dwarf and pygmy sperm whales are probably also rare, but scientists are not sure of their numbers. Although sperm whales are no longer hunted for their oil and blubber (thick fat under the skin), they are still threatened by pollution, becoming trapped in fishing gear, and colliding with ships. Noise pollution from ships, oil drilling, underwater explosions,



and military exercises is a particular problem because sperm whales rely so heavily on sound for all aspects of their underwater life.

▲ *The massive tail flukes of a sperm whale break the surface of the water as the whale dives to the ocean depths.*

DID YOU KNOW?

- 🐾 Male sperm whales weigh three times as much as females.
- 🐾 Sperm whales can dive to depths of more than 3,300 feet and stay underwater for longer than an hour!
- 🐾 Sperm whales sometimes hunt giant squid and jumbo squid.
- 🐾 Sperm whales dive to the seabed for food, shoveling up anything lying there, including stones and tin cans!
- 🐾 Baby sperm whales, called calves, are around 13 feet long at birth and may weigh as much as 2,200 pounds!

SQUIRRELS

Most squirrels have large eyes, a bushy tail, and long back legs. The hundreds of different species include burrowing marmots, prairie dogs, tree squirrels, and flying squirrels. Many spend at least half of their life in a deep sleep called hibernation.





Squirrels are active and clever mammals. They have evolved different body forms and habits that suit them for life in a range of habitats. They live worldwide in large numbers in lush rain forests, dry deserts, open prairie grasslands, and backyards. Squirrels have keen eyesight for spotting predators and touch-sensitive whiskers on the head, feet, and the outside of the legs. A squirrel's bushy tail helps the animal balance when it runs and climbs, acts as a rudder for steering when it jumps, works like a flag to signal to other squirrels, and can be wrapped around the body like a blanket.

Powerful Legs and Sharp Claws

Ground-dwelling squirrels have a heavy body, with powerful front legs and large claws for digging. In contrast, tree squirrels have a lighter, longer body, less muscular front legs, and sharp claws on all their toes. Tree squirrels come down trees headfirst, turning their back feet backward and sticking their claws into the bark, which helps anchor them. All squirrels have soft pads on the soles of their feet, which gives them a better grip on surfaces and food. Desert squirrels have furry feet, which help them walk over hot sand.

Mainly Vegetarian

Squirrels are mainly plant eaters, but they also feed on insects. Most tree squirrels and flying squirrels also eat birds' eggs and baby birds. Ground-living squirrels

A large, bushy tail and ear tufts characterize the red squirrel of Europe and Central Asia. Red squirrels usually live alone, only coming together to mate.

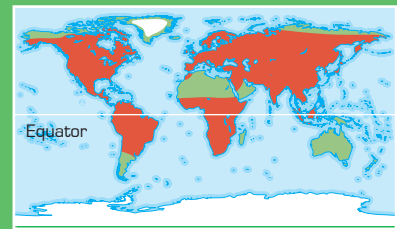
Fact File

SQUIRRELS

Family: Sciuridae (273 species)

Order: Rodentia

Where do they live? Worldwide, except Australia, Polynesia, Madagascar, southern South America, and the Sahara desert



Habitat: Varied, including rain forests, cooler forests, tundra, alpine meadows, deserts, fields, and parks

Size: Varies with species: head-body length 2.6–28.7 inches (6.6–73 cm); weight 0.35 ounce–17.6 pounds (10 g–8 kg)



Coat: Varies from red or brown to gray; some with stripes

Diet: Nuts, seeds, fruit, flowers, sap, grass, bulbs, and fungi; also insects, birds' eggs, and young birds

Breeding: Reach adulthood at around 1 year; 1–6 (up to 11) offspring; one or two litters a year

Life span: 2–14 years; females usually live longer than males

Status: Many species are threatened or endangered; red squirrels are near threatened

SQUIRRELS






1

even eat each other's offspring. In cooler parts of the world, a squirrel's diet may change with the seasons.

Squirrels have a pair of chisel-shaped cutting teeth (incisors) at the front of each jaw. These teeth grow throughout a squirrel's life and are worn down as it feeds. Some chipmunks and ground squirrels carry food in cheek pouches. When

DID YOU KNOW?

-  Large flying squirrels can glide for 330 feet or more!
-  American red squirrels may store up to 18,000 pine cones in one big larder!
-  Inside the winter nest of a red squirrel, it may be 68°F warmer than it is outside!

1. *Alpine marmot*
2. *Indian giant or Malabar squirrel*
3. *African pygmy squirrel*
4. *Abert or tassel-eared squirrel*
5. *Southern flying squirrel*
6. *Shrew-faced ground squirrel*
7. *American red squirrel*
8. *Prevost's squirrel*
9. *Geoffroy's ground squirrel*
10. *Siberian chipmunk*





feeding, squirrels squat on their back legs and hold the food to their mouth in their short front paws.

Squirrels that live in cooler forests bury stores of nuts and cones, which help them survive long, cold, winters. Gray and red squirrels might bury hundreds of nuts each year. Although squirrels can smell the nuts as deep as 12 inches below the surface of the ground, many nuts are never dug up and eaten. Eventually some of these nuts sprout. That helps the trees spread and grow in new areas. Douglas squirrels and American red squirrels store pine and spruce cones in huge larders, often under logs. Each squirrel defends an area called a territory around these larders. Squirrels warn away rivals by making screeching and rattling calls, and sometimes chase and fight rivals.

Surviving the Winter

Some squirrels that live in places with a cold winter season may have long resting periods or enter a deep, sleep-like state called hibernation during winter. They build a cosy nest in a tree or find a tree hole or underground burrow. Tropical and desert-living species might remain active all year round.

A squirrel's round nest, called a drey, is made of small branches, twigs, and grass. It is thickly lined with dry grass, moss, and fur. Although it is much warmer inside



FLYING SQUIRRELS

The furry “wings” of flying squirrels are made from flaps of skin stretched between their arms and ankles along the sides of their body. These “wings” work like parachutes to trap air, so the squirrel falls slowly down through the air, gliding from tree to tree. As it glides, the squirrel steers by changing the position of its legs and bushy tail and also by stretching its furry “wings” tightly. Gliding saves energy and helps squirrels escape from predators in the trees. However, these “wings” make it hard for the squirrels to move on tree trunks and branches, which is probably why these squirrels come out at night. That makes it easier for them to avoid birds of prey, which are active during the day.

SQUIRRELS

its drey, a squirrel has to go outside to find food every two days or so, even in bad weather.

Ground squirrels and marmots spend the winter hibernating in burrows. They live off stores of food or on fat stored in their body. During hibernation, the speed of the squirrel's body processes slows down to save energy. Every two to four weeks, the squirrel wakes up to urinate and produce droppings. By the time it emerges from hibernation, the squirrel will have lost more than half its body weight.

Baby Squirrels

Baby squirrels are naked, toothless, blind, and helpless when they are born, but they develop rapidly. Young red squirrels have grown all their fur by the time they are three weeks old and are independent at eight to ten weeks. By this time, they have enough climbing skills to survive in the trees. Young ground squirrels develop even faster. Chipmunks and ground squirrel pups are independent by three or four weeks, and marmot pups by six weeks. It is dangerous for these squirrels to stay in the nest for too long because they can be trapped by digging predators.







MARMOT FAMILIES

For yellow-bellied marmots (above), living in family groups brings many benefits. A group can defend its food resources more successfully than an individual, which ensures members never go hungry. Many extra pairs of eyes also increases the chances of spotting a predator before it gets too close. In addition, animals in large groups survive better and have more offspring.



DID YOU KNOW?

-  Siberian chipmunks can carry around 0.3 ounce of grain in their cheek pouches for distances of more than half a mile!
-  Marmots may hibernate for as long as nine months of the year!
-  During hibernation, an alpine marmot may lose more than half of its body weight!
-  Cape ground squirrels live in burrows that may have nearly a hundred openings!


In most species of tree squirrels, ground squirrels, and chipmunks, only the mother looks after the offspring. Marmots, prairie dogs, and some other ground squirrels live in family groups of female relatives. In

other squirrel species, the males live with female groups and sometimes help care for the babies.

Threats to Squirrels

The greatest threat to squirrel populations is the growing number of people, who are destroying squirrel habitats by cutting down trees and taking plants from one country to another. Squirrels are also hunted for their fur, for sport, and because many people consider squirrels as pests and carriers of diseases. Little notice has been taken of the ways in which squirrels help habitats—by spreading seeds, controlling insect pests, and mixing the soil so that air and nutrients can circulate.



 A gray squirrel has come to the ground to look for food. Gray squirrels have a varied diet that includes acorns, nuts, seeds, fruit, insects, fungi, and sometimes baby birds.

TAPIRS

These shy, water-loving mammals are the survivors of an ancient group, and they still have a prehistoric look about them. The tapirs' tropical forest homes are being cut down by people, and these animals are becoming rare.





Tapirs look like pigs but are more closely related to horses and rhinoceroses. Tapirs are members of the order Perissodactyla, hoofed mammals with an odd number of toes. Tapir ancestors appeared around fifty-five million years ago, and for a long time many different tapir species existed. Now there are just four species, and they have changed so little over time that scientists sometimes call them “living fossils.”

Tapirs have a bulky, barrel-shaped body but are surprisingly agile. Their slim legs have three well-developed toes on each foot. The front feet have a small fourth toe, similar to the dew claw of a dog, which does not touch the ground. The tapir’s head is small and has oval ears and a droopy snout, or proboscis, with nostrils at the end. A tapir moves its proboscis around in the air or in cracks and crevices to sniff for food. It also uses the proboscis to grasp shoots, leaves, and other food. Tapirs have coarse hair, which is dark brown to black in most species. The bold black-and-white markings of the Malayan tapir help break up its outline, so it is difficult to see at night as it moves through moonlit tropical forests. Young tapirs are brown, with pale spots and stripes.

Spreading Seeds and Passing Messages

Tapirs eat all kinds of plant material, which they grind with powerful jaw muscles. They particularly like fruit and provide an important service for many plants—

A male Malayan tapir curls its top lip in an action called the flehmen response. It is testing the scent of a female tapir to find out if she is ready to breed.

Fact File

TAPIRS

Family: Tapiridae (4 species)

Order: Perissodactyla

Where do they live? Central and South America and Southeast Asia



Habitat: Tropical forests and grasslands

Size: Head-body length 6–8 feet (1.8–2.5 m); weight 330–660 pounds (150–300 kg)

Coat: Short and coarse, dark brown to black in



American species; Malayan tapir has a white body with dark head, forequarters, and hind legs

Diet: Grass, shoots, leaves, fruit, and other plant material

Breeding: 1 offspring, occasionally twins; 13 months’ gestation; mature at 24–36 months

Life span: Up to 35 years




Status: Endangered in the Americas; Malayan species is vulnerable

TAPIRS

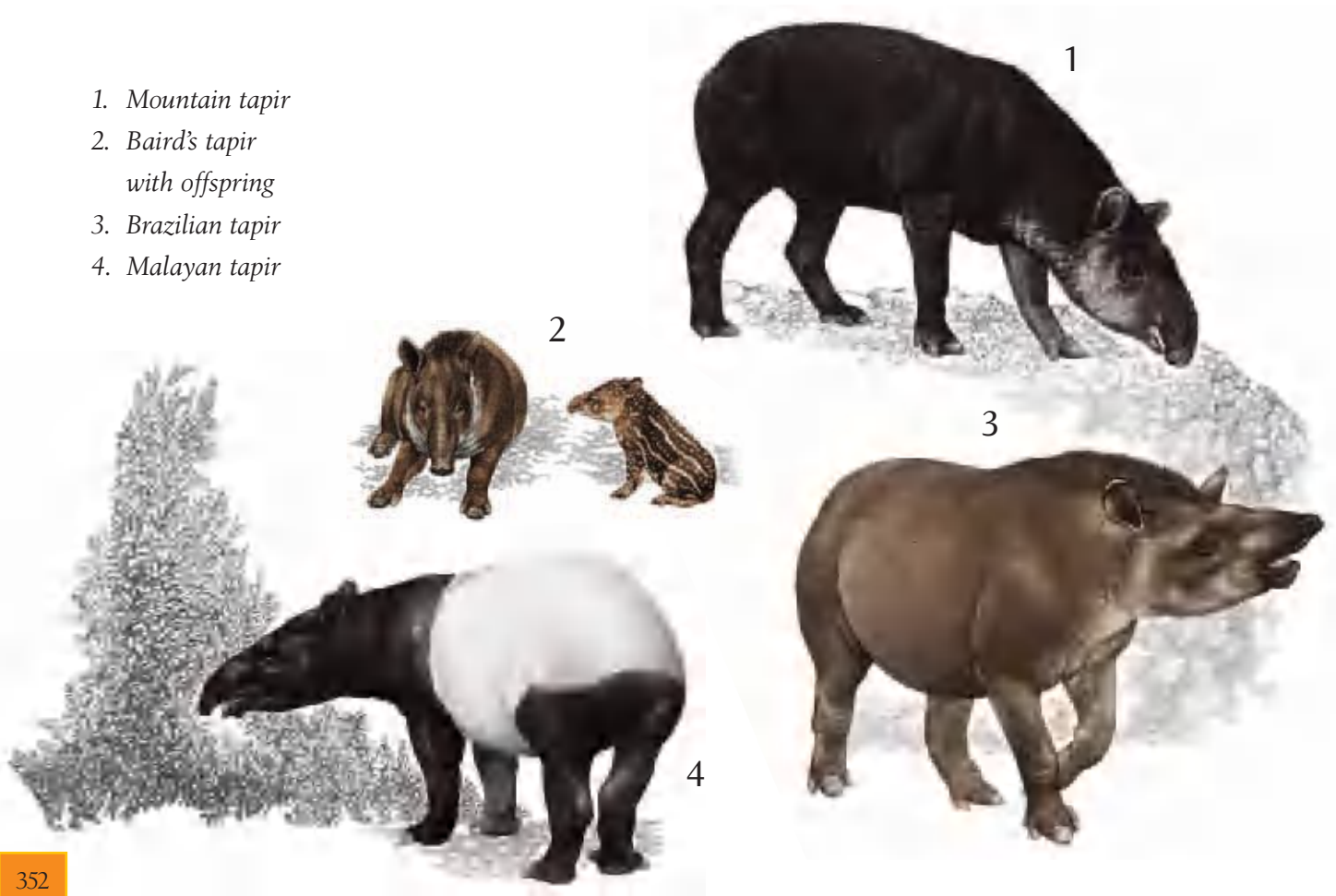
spreading far and wide the seeds that pass out of the body in their droppings. Brazilian, Baird's, and Malayan tapirs are active mainly at night and spend a lot of time in water. The mountain tapir lives in cooler climates. It spends less time in water and is active during the day.

Tapirs usually live alone, except for mothers with offspring. Tapirs are not usually bad tempered, but they

DID YOU KNOW?

-  The Malayan tapir has the longest proboscis. It looks like a short trunk!
-  Tapirs communicate using loud whistles, and they answer when people imitate these calls!
-  In the forests of Ecuador, tapirs help up to one-third of all plant species by spreading and fertilizing seeds with their droppings!

1. *Mountain tapir*
2. *Baird's tapir with offspring*
3. *Brazilian tapir*
4. *Malayan tapir*





WATER LOVERS

Tapirs are excellent swimmers and can hold their breath underwater for several minutes. They often feed on water plants and seem to enjoy wallowing; mud and water help keep them cool and free from flies and skin parasites. Tapirs also use water as a refuge from land predators, such as bears and jaguars. A tapir tries to sink underwater until the attacker is forced to let go. However, that technique does not work so well with anacondas, which are giant South American snakes, and crocodiles. Both of these predators often successfully hunt baby tapirs in the water.

prefer to be on their own. Adults use scent to pass messages to each other, leaving splashes of urine and heaps of dung here and there around their home patch, or territory.

Time to Breed

Male tapirs use an extra scent detector, the Jacobson's organ, in the roof of the mouth to find out whether a female is ready to breed. When testing female scent, the male curls up its lips in a type of snarl, called the flehmen response. If several males are interested in the same female, there may be a short fight, but the smallest males usually give up quickly and leave. After mating, the male moves on and does not help rear his offspring. Female tapirs spend up to two years caring for the single youngster until it is able to fend for itself.

Tapirs Under Threat

Tapirs are shy and nervous, and with good reason. All four species are hunted by bears, crocodiles, big cats such as jaguars, pumas, leopards, and tigers, and also by people. In addition, tapirs are also threatened by habitat loss due to logging and other human activities.

TARSIERS

These tiny, goggle-eyed monkeys are extremely nimble and acrobatic. They can leap forty times their own body length from tree to tree, using hind legs that are twice as long as the rest of their body.





Tarsiers are small primates that live on islands in the Indian and Pacific oceans, including Sumatra, Borneo, Sulawesi, and the Philippines. There are seven species, of which the smallest is the pygmy tarsier, which could sit comfortably in a child's hand. Tarsiers have extremely long legs, fingers, and toes. Each finger and toe has a wide pad and a sharp claw. These pads allow the tarsier to grip smooth surfaces, and the claws provide grip on rough surfaces. So, tarsiers can climb most things in their forest home.

Large-eyed Night Hunters

Compared with the size of their body, tarsiers have the largest eyes of any mammal—each eye of Horsefield's western tarsier weighs more than its brain. Tarsiers are active at night, and their huge eyes help them see in the dark. Tarsiers sleep in the trees during the day and come out at dusk to search for food—mainly insects, such as moths, beetles, and cicadas. They catch their prey with their hands. Large tarsier species catch and kill birds even bigger than themselves.

Tarsiers live in pairs or small groups, which stay in touch using a variety of calls. In some species, males and females perform singing duets early in the morning. Singing helps maintain the bonds among them and warns other tarsiers that a territory is already taken. Tarsiers use scent to mark their home patch. They rear one baby at a time, after a long pregnancy.

Clinging on tightly with its long fingers and toes, a tarsier sits on a branch. Its enormous, forward-facing eyes allow it to judge distances accurately.

Fact File

TARSIERS

Family: Tarsiidae (7 species)

Order: Primates

Where do they live? Islands of Southeast Asia



Habitat: Tropical forests

Size: Head-body length 3.7–5.7 inches (9.5–14.5 cm); weight 3.5–5 ounces (100–140 g)

Coat: Short and velvety; buffy brown to gray; paler on belly and chest; tail usually has sparse tuft of longer hairs toward tip



Diet: Mostly insects and other invertebrates; some small reptiles and birds

Breeding: 1 large offspring, born after 190 days' gestation; weaned at 10 weeks; mature at 12 months or more

Life span: 8 years in the wild, and up to 12 years in a zoo

Status: Most species are too little known to be sure; conservationists are concerned about all species



TASMANIAN DEVIL

These fearsome-looking marsupials were named devils by early European settlers in Australia. It has taken hundreds of years for people to realize that Tasmanian devils are not dangerous and that they are in desperate need of help.





The Tasmanian devil and its cousin the thylacine, or Tasmanian wolf, were once the only large mammalian predators living in Australia. They were driven to extinction on the mainland by the dingo, a type of wolf introduced by Aboriginal people from Asia 3,500 years ago. Now, Tasmanian devils live only on the island of Tasmania, and the thylacine is extinct.

European settlers in Australia hated Tasmanian devils as soon as they saw them. These stout marsupials look and sound fearsome, and their hyena-like habits of scavenging and squabbling over food made them instantly unpopular. They were hunted and trapped for 200 years. However, in the last 50 years people have begun to see another side to Tasmanian devils. They are quite timid animals, and the toothy snarl that once seemed so threatening is now known to be a sign that the animal is frightened. Since the last known thylacine died in the 1930s, the people of Tasmania have begun to take more care of the Tasmanian devil, and there is now a lot of support for its conservation.

Fighting Over the Dead

Most of the time, Tasmanian devils live alone, but they often gather where there is food. They eat a lot of dead animals, which they often find on roadsides. Tasmanian devils move around their home range at night, sniffing and foraging around in search of food. They have an excellent sense of smell and good hearing. They are

A solitary Tasmanian devil surveys its surroundings. Although they live mostly alone, these marsupial carnivores often gather to feed together at carcasses.

Fact File

TASMANIAN DEVIL

Sarcophilus harrisii

Family: Dasyuridae

Order: Dasyuromorphia

Where do they live? Tasmania



Habitat: Temperate forests and scrublands

Size: Head-body length 20–25 inches (50–62 cm); weight 10–30 pounds (4.4–13 kg)



Coat: Coarse, dark brown to black fur, with white chest and small white patches on other parts of body

Diet: Small birds, mammals up to the size of wallabies, and carrion

Breeding: 3–4 offspring, born after 31 days' gestation; carried in pouch for 15–16 weeks; weaned at 8 months; mature at 12 months

Life span: Up to 6 years

Status: Lower risk, least concern; several other marsupial carnivores are seriously threatened



TASMANIAN DEVIL

attracted by the sounds of other Tasmanian devils feeding, so it is quite common for several of them to turn up and begin fighting over a dead animal.

Tasmanian devils are well equipped for scavenging. Their large jaws are powered by huge muscles

and contain bone-crushing teeth. They eat quickly, tearing off large chunks of meat and swallowing them without chewing, in an effort to eat as much as possible before other Tasmanian devils arrive.

In addition to scavenging dead meat, Tasmanian devils also hunt

▶ *As it yawns, a Tasmanian devil reveals its sharp teeth and powerful jaws. Many of these animals catch a deadly disease called devil facial tumor disease.*



DEADLY DEVIL DISEASE

The biggest threat to Tasmanian devils now is a nasty disease known as devil facial tumor disease, or DFTD. The disease was first noticed in 1996. It seems to be a type of cancer. It causes tumors on the face, especially around the mouth. These tumors grow fast and can make it impossible for the Tasmanian devil to eat. Unusually for a cancer, DFTD seems to be infectious—one Tasmanian devil can catch it from another. In some parts of Tasmania, DFTD has killed up to 80 percent of the population.



living animals, including birds, reptiles, and small- to medium-sized mammals, such as rabbits, young wombats, and wallabies. Tasmanian devils may occasionally kill a lamb, but they are not a serious risk to livestock, as people once thought.

Pouched Devils

Like other marsupials, baby Tasmanian devils are born small and underdeveloped. They must crawl to the mother's pouch and attach themselves to a teat. They continue to grow and develop in the mother's pouch and are finally ready to leave at around four months old. They start eating meat given to them by their parents at five or six months old, and they are ready to start life alone at ten months.

Other Marsupial Carnivores




Tasmanian devils are probably the largest living marsupial carnivores. There are almost seventy other species of marsupial carnivores. They live in parts of Australia and New Guinea and come in all shapes and sizes. Most are small, mouselike animals, such as the insect-eating dunnarts and antechinus. Others, such as the phascogales, look like



squirrels, and quolls are similar to mongooses in size and habits. Another carnivorous marsupial is the numbat. This squirrel-sized animal, with its stripy back, bushy tail, pointed snout, and bandit mask, specializes in eating termites and lives only in Western Australia.

▲ *A numbat sits atop a fallen log. Numbats spend most of their days searching for food. Like Tasmanian devils, numbats are marsupial carnivores.*

DID YOU KNOW?

- 
 A Tasmanian devil can eat up to 40 percent of its body weight in meat in one feeding frenzy!
- 
 The scientific name *Sarcophilus* means "flesh lover" and describes the Tasmanian devil's fierce meat-eating habits.
- 
 Tasmanian devils are walking waste-disposal machines—they are able to crunch up all the parts of other animals, including the toughest hides and the largest bones!

TIGER

Tigers are fearsome hunters, and they often eat animals larger than themselves. Tigers are ambush hunters—they pounce on their prey without any warning.





Tigers are extremely large and strong. Along with lions, tigers are the biggest of all the cats. A tiger's furry coat is orange, with black vertical stripes. Many tigers have a ruff of longer fur at the back of the neck. No two tigers have exactly the same pattern of stripes. Often the pattern on a tiger's left side is different compared with its right side. A tiger's tail is long and has orange and black stripes.

Most tigers are forest animals but some live in tall grasslands or swamps. The most important things they need from their habitat are plenty of food and lots of vegetation to give them cover while they are hunting. Their stripy coat looks bright in the open, but in the dappled light of the forest a tiger can become almost invisible, slinking silently along in search of food.

Meat Eaters

Tigers are meat eaters. A hungry tiger uses its eyes and ears to find food. It listens carefully for the sound of a breaking branch, for example, as a deer walks through the forest and looks to see the movement of the animal through the trees. Then the big cat stalks (quietly follows) the deer until it is much closer. The tiger may then remain still for a few minutes until it is ready to strike. When it is ready, the tiger runs and leaps at its prey. Some people have seen a tiger making a horizontal leap of more than 30 feet, which is twice the length of an automobile.

When it is hungry, a tiger will go hunting. This tiger has seen its prey and is running quickly toward it. The tiger will then leap on its victim and kill it.

Fact File

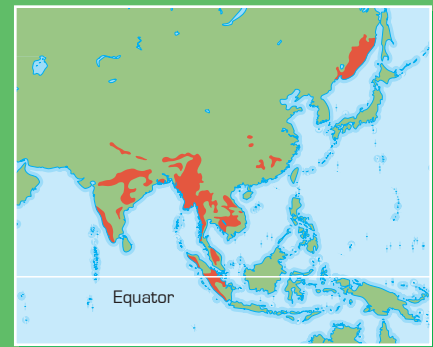
TIGER

Panthera tigris

Family: Felidae (5 subspecies, or local types)

Order: Carnivora

Distribution: India, Southeast Asia, China, and southeastern Russia



Habitat: Varied, including rain forests and reed beds

Size: Head-body length 7.9–10.2 feet (2.4–3.1 m); weight 220–559 pounds (100–258 kg)



Coat: Black stripes on orange background on back and sides; underside mostly white

Diet: Mostly large mammals, including wild deer, cattle, and pigs

Breeding: Reach adulthood at 3–5 years; usually 2–3 cubs; independent after 1.5–2 years

Life span: Up to 15 years in the wild, and 26 years in zoos

Status: Endangered

TIGER

As well as being strong, tigers also have long, sharp teeth and claws. They hold onto their victim with their claws and use their teeth to bite into the back of its neck. As they are so strong, tigers can kill animals much bigger than themselves. They often kill and eat deer, buffalo, and wild pigs. Less often, tigers eat monkeys, baby elephants, birds, and even fish. Not all attacks are successful. However, if the tiger does grab its prey, the victim stands little chance of making an escape. The tiger then eats until it is no longer hungry. If any meat remains, the tiger may carry it away to a safe place where it can have another meal later.

The largest tigers live in parts of India and Russia. They are subspecies (local types) called Bengal



TIGER CUBS

Female tigers usually give birth to litters of two or three cubs. When they are born, the cubs are tiny, weighing only 27–56 ounces. They grow quickly, however, and by eleven months they can kill other animals. When they are eighteen months or two years old, the cubs leave their mother and go off to fend for themselves.

A TIGER STALKS ITS PREY



1 A tiger creeps up on its prey, hiding in long grass.



2 Leaping up from its crouch, the tiger bounds toward the startled deer.





tigers and Amur tigers. The larger males weigh between 400 and nearly 600 pounds. Some of these tigers are more than 10 feet long from the tip of their nose to the tip of their tail. Tigers that live on the Indonesian island of Sumatra are much smaller, weighing up to 330 pounds.

Sunderbans Tigers




Around four-fifths of the world's wild tigers are Bengal tigers. Most Bengal tigers live in India. One of the best areas of tiger habitat in the world is a place called the Sunderbans swamp near Calcutta in India. The Sunderbans tigers are famous, but often for the wrong reasons. More people are killed by tigers here than anywhere else in the world—around a hundred people every year.

Solitary Killers

Tigers usually live alone, apart from mothers with their cubs. Adult tigers rarely come within 1 to 3 miles of each other. A mother may allow her daughter to live nearby after she has become independent. However, there is trouble if the younger animal strays onto her mother's territory. Sometimes, tigers share a meal when one has killed a large animal, but they only tolerate company for a short while.

Tigers are usually nocturnal (active at night). However, sometimes tigers hunt during the day, especially in northern regions, where the nights are extremely cold. Tigers can climb trees but unlike some other large cats, they do this rarely. They are also strong swimmers. They swim using

DID YOU KNOW?

-  Tigers can swim and often eat fish!
-  Tigers can jump 30 feet in a single leap!
-  A tiger's roar can be heard approximately 2 miles away!



TIGER



SAVING THE TIGER

Tigers used to live all over southern Asia but they have become rare. Most of their problems are caused by people. Many of the forests in which they once lived have been cut down to make space for farms and towns. In many places, tigers have been hunted until there were none left. Most of the remaining wild tigers live in protected preserves, but some are still hunted.

🐾 *A tiger pads silently through the rain forest on its massive paws. As a result of habitat destruction, there are fewer than 8,000 tigers now living in the wild.*

a strong dog-paddle. In hot weather, tigers cool down by lounging in a pool, and sometimes they catch fish.

Raising Cubs

Tigers mate throughout the year, but mostly between November and April. That is the only time adult tigers are seen together. A female tiger is pregnant for around 100 days. Usually, she then gives birth to two or three cubs, but this number can range from one to six. By this time, the cub's father is long gone and he does not help raise the cubs.

The newborn cubs are tiny. They feed only on their mother's milk for three to six months. After that time they will eat meat that the mother brings to them. The mother tiger is fiercely protective of her young cubs. She will not let any other tiger come near. Male tigers are especially dangerous as they may try to kill the cubs to bring their mother into breeding condition once again. However, the cubs seem unaware of these dangers. They spend their days



playing, feeding, and sleeping. They love to chase each other and to play fight. They also play with their food. When they are old enough to eat meat, their mother brings them live animals so that they can practice hunting for themselves. All of these games help the cubs gain the skills they will need when they are older.

Tiger cubs grow quickly. They can hunt successfully before their first birthday but they are not fully independent of their mother until

they are at least eighteen months old. However, half of all tiger cubs do not survive to the age of two years.

DID YOU KNOW?



Some tigers are white with black stripes and blue eyes. Most of these unusual tigers live in zoos.



A large tiger's claws are as long as human fingers.



Tigers can live up to twenty-six years, but wild ones rarely live for more than eight or nine years.

Instead of the usual pattern of black stripes on an orange background, this tiger is white and has black stripes.



TREE SHREWS

These tropical forest dwellers look like a cross between a shrew and a squirrel but have other features in common with primates. There is evidence that tree shrews are closely related to both primates and colugos (gliding lemurs).





Tree shrews are placed in their own order (group), Scandentia, which means “scramblers.” Despite their name, not all tree shrews live in trees. Most spend part of the day on the ground and some hardly ever climb. These mammals have a long body and a long, relatively bushy tail, sometimes with a tuft of long hairs at the end in tree-climbing species, or bushy and squirrel-like in the ground-dwelling species. A tree shrew flicks its tail around as it moves to help it balance. Ground-dwelling tree shrews have a long, pointed snout, while tree-climbers have a short face, more like that of a squirrel.

Leaf-litter Rummagers and Part-time Mothers

Trees shrews eat a wide variety of food and spend much of their time looking for it. They rummage in undergrowth and leaf litter for fruit, seeds, insects and other invertebrates, and even baby mice and small lizards. Most tree shrews hunt by day, but the pentailed tree shrew is nocturnal (night active).

Male tree shrews do not help rear the offspring, and even the females spend little time with them. Each baby in a litter is born in a separate nest, and the mother visits them only once every day or two to nurse them. By spending little time at each nest, the mother avoids drawing the attention of predators to it. Young tree shrews leave the nest at four weeks old, by which time some have spent less than two hours with their mother.

A pygmy tree shrew grips onto a branch using its strong claws. These tree shrews often rub along a branch, leaving scent from a gland in the stomach.

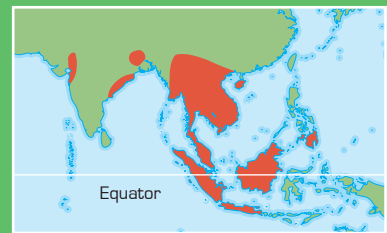
Fact File

TREE SHREWS

Families: Tupaiidae (19 species) and Ptilocercidae (1 species)

Order: Scandentia

Where do they live? India, China, and Southeast Asia, including the Philippines and Indonesia



Habitat: Tropical forests

Size: Head-body length 3.5–9 inches (9–23 cm); weight 1.8–11 ounces (50–300 g)



Coat: Fine, dense, and soft; usually grayish brown to rich red-brown.

Diet: Invertebrate animals, including insects and millipedes, some small vertebrates, fruit, seeds, and other plant material

Breeding: 1–3 offspring, born after 45–50 days' gestation; weaned at 4 weeks; mature at around 3 months

Life span: Up to 12 years in a zoo

Status: 5 species are vulnerable; 2 species are endangered



VOLES AND LEMMINGS

Voles and lemmings cope with some of the harshest winter conditions of any rodents. Many live more than half of their life under a blanket of snow. In the summer, they have some of the fastest breeding rates of any mammals.





Voles and lemmings live mainly in northerly countries, and many are able to cope surprisingly well with long, cold winters. They are mostly small, mouse-sized animals with thick fur and a chubby face. Those parts of the body that lose heat the fastest, such as the legs, tail, and ears, are all short. Lemmings have a particularly tough life. Most live within the arctic circle, where it is dark for much of the winter and the temperature stays well below freezing for months.

Despite the hardships of winter, voles and lemmings do not hibernate. They stay awake and active and continue to look for food all winter, using a network of tunnels under the snow to move around, gathering frozen grass and other food.

Voles and lemmings eat a variety of food, but their diet varies among species and with the seasons. In spring, they eat mostly green shoots and tender new leaves, in summer they take advantage of ripe fruit and berries, moving onto seeds and nuts as they ripen. Some species of voles and lemmings collect extra food, such as nuts, seeds, and hay, and store it in their burrows to help them survive the harsh winter.

Sharp Teeth and Territorial Behavior

Like other members of the rat and mouse family, voles and lemmings have a pair of large, chisel-shaped incisor teeth in both the upper and lower jaw, separated from the cheek teeth by a wide gap. The incisor teeth

A bank vole scurries down a slope toward a river. As their name suggests, bank voles live in riverbanks and swamps, in Europe and Asia.

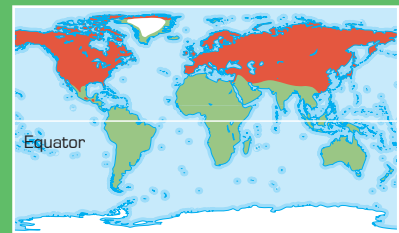
Fact File

VOLES AND LEMMINGS

Family: Muridae; subfamily Microtinae
(143 species)

Order: Rodentia

Where do they live? Temperate and subpolar lands of northern hemisphere



Habitat: Tundra, fields, meadows, woodlands, and riverbanks

Size: Head-body length 4–13 inches (10–32 cm); weight 0.6–64 ounces (17–1,800 g)



Coat: Thick and sometimes shaggy; usually brown to black; some lemmings have bold markings

Diet: Mainly plant material

Breeding: Extremely rapid; several litters of 1–12 born in a season, after 16–28 days' gestation; weaned at 3–6 weeks; mature at 2–8 weeks

Life span: 6 months–2 years

Status: 3 species are critically endangered; 3 species are endangered






VOLES AND LEMMINGS

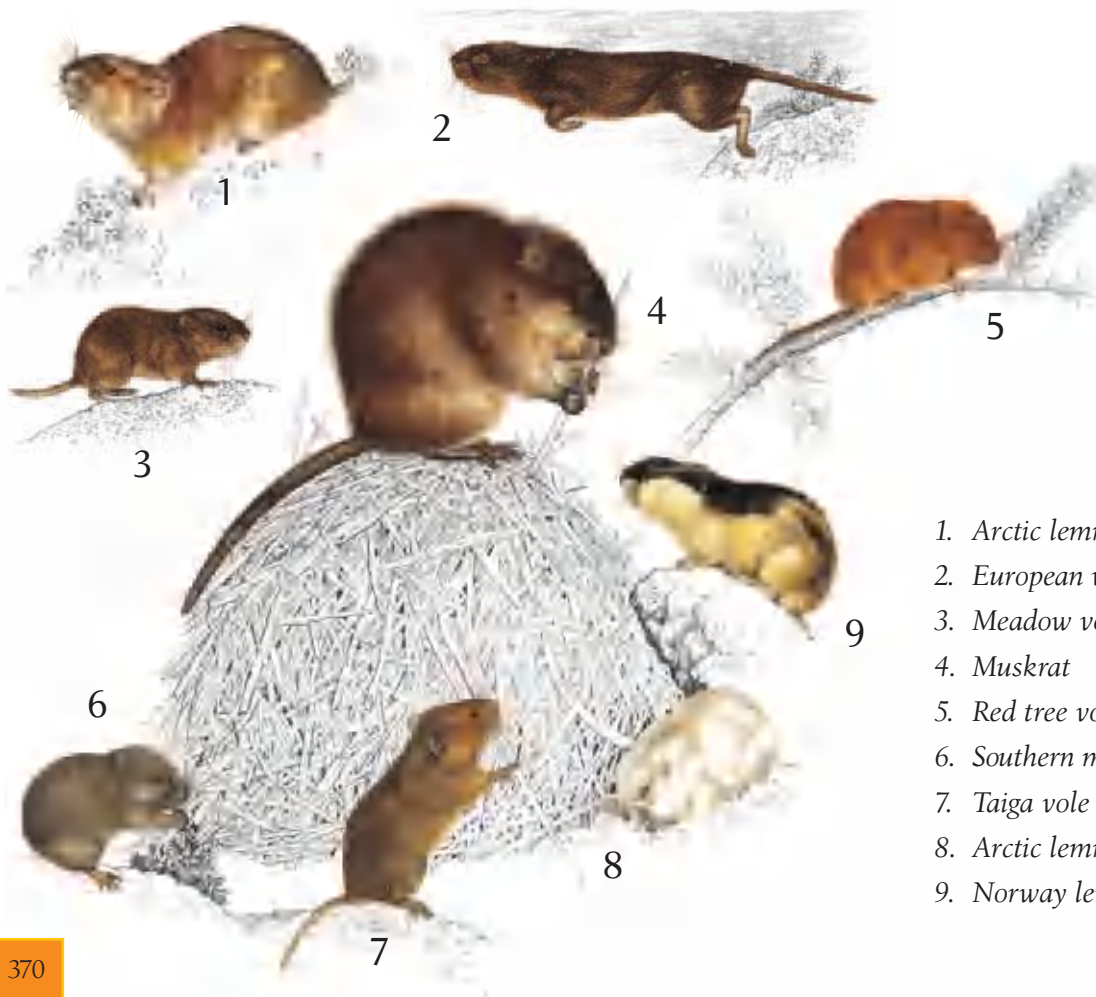
are used for gnawing, while the cheek teeth are used for grinding plant material. The gap between the incisors and cheek teeth allows the animal to close its mouth when it has bitten off chunks of food.

A vole's teeth, including its grinding molars, continue to grow well into adult life. The jaws are controlled by large muscles in the animal's cheeks, giving the animal its typical chubby-faced appearance.

Voles and most species of lemmings spend their life within a fairly small area. Males can be highly territorial. Scent is important, and they use droppings, urine, and scent from skin glands to mark their patch. The scent of a mature male can bring females into season and speed up the development of young females. Most species can swim, and some, such as the musk rat and European water vole, are completely at home in water.

DID YOU KNOW?

-  The claw on the first toe of each lemming's front foot is large and shaped like a small shovel, which makes it ideal for digging in the snow!
-  There are 143 species of voles and lemmings. Some are so similar that even experts struggle to tell them apart.
-  Water voles in the United Kingdom live in riverbanks and swim well, but water voles in Eastern Europe and Siberia live underground, far from water.



1. Arctic lemming in its summer coat
2. European water vole
3. Meadow vole
4. Muskrat
5. Red tree vole
6. Southern mole vole
7. Taiga vole
8. Arctic lemming in its winter coat
9. Norway lemming



LEMMING MIGRATIONS


Folklore has it that every few years lemmings commit mass suicide by throwing themselves over cliffs or into the sea. However, these tales are not true. High numbers of deaths are caused by overcrowding and usually take place after a mild winter, during which lemmings continue to breed. Young lemmings try

to move away from the crowd to find space to live but find themselves caught up in a mass of other lemmings trying to do the same thing. The situation becomes more and more desperate, resulting in hordes of lemmings rushing across the countryside and not stopping for anything—rivers and cliff edges included.

Short Lives, Fast Breeders

Voles and lemmings are defenseless against predators and are among the most commonly eaten of all small mammals. The only defense that voles and lemmings have against the never-ending attacks of larger mammals, snakes, and birds of prey is to breed fast. Voles and lemmings are famous for a “boom and bust” pattern of breeding, with females rearing a litter every three or four weeks—sometimes as many as forty

offspring a season. Female field voles breed at just four weeks old, but Norway lemmings are the real champion breeders. Some can mate and become pregnant at just two or three weeks old. These amazing breeding rates mean that populations of voles and lemmings can build up extremely quickly, leading to “vole plagues” and the famous mass migrations of lemmings. Huge populations are not stable, however, and their numbers soon fall again.

 *Mass migrations of Norway lemmings often lead to panic and the death of a number of the animals.*

WALRUS

With its huge flabby body, tiny bloodshot eyes, and bristly moustache, the walrus would not win any beauty contests.

But its enormous tusks are so highly prized as ivory that the species was once hunted nearly to extinction.





Walruses may look awkward on land but they are powerful and agile underwater. Their paddlelike front flippers help them swim at up to 20 miles an hour. These flippers are also used for moving around on land or ice floes and for scratching the body. The hind flippers are used mainly for steering in the water, but on land the walrus can swing them forward under its body to help support its enormous bulk.

Both male and female walruses grow tusks, although the male's are larger. The tusks are used for display and fighting. Walruses live in large groups, and quarrels over space are common. The most serious fights occur between males during the breeding season. It can take fifteen years for a male to grow large and powerful enough to have a chance to mate. In any year, only around 10 percent of males get to breed. Walruses mate in the water, and courtship involves many complicated calls. Females rear one calf every two years. Females and calves form nursery colonies, and young walruses stay close to their mother for at least three years.

Arctic Ice Habitat

Walruses prefer to haul out on ice rather than on dry land and they try to stay close to the edge of the arctic ice. They can make breathing holes in ice that is up to 9 inches thick by ramming it with their head, using their tusks to chip ice away from the hole to keep it open. As the ice becomes too thick in winter, walruses

A walrus displays his enormous tusks, tough, wrinkled skin, and mustachelike hairs. These sensitive hairs help the walrus find food in the dark on the seafloor.

Fact File

WALRUS

Odobenus rosmarus

Family: Odobenidae

Order: Carnivora

Where do they live? Arctic Ocean and other far northern seas



Habitat: Open water, pack ice, and some rocky beaches

Size: Head-body length 8–10 feet 6 inches (240–320 cm); weight 1,250–2,670 pounds (565–1,210 kg)



Coat: Extremely sparse hairs, mainly on face, neck, and shoulders; light brown to bright pink skin

Diet: Mollusks, worms, and fish; occasionally smaller seals and sea birds

Breeding: 1 offspring born after 15–16 months' gestation; weaned at up to 2 years; mature at 4–10 years

Life span: 40 years or more

Status: Has recovered from serious decline in the past

WALRUS



▲ *A male walrus has extremely long tusks. On land the tusks are often used as a lever and to make breathing holes in the ice.*

swim south to find open water. They then travel north again in spring as the ice melts. Some walrus migrate (make a round trip) of around 1,800 miles each year.

Thick Skinned and Fat

Walrus skin is extremely tough, which protects it from sharp rocks and ice. Most females and calves also have a thin coat of coarse fur. Male walrus are often almost bald, with




knobby skin on the neck up to 2 inches thick, which protects them from stab wounds when fighting. Beneath the skin is layer of fat up to 4 inches thick. This fatty layer protects the walrus from tusk wounds and keeps it warm in icy water.

Walrus have no problem coping with the cold but they struggle with heat. A large male lying in the sun soon flushes bright pink and has to take plenty of cooling swims. That usually means losing his place on the beach or ice floe, and another squabble over space takes place when he hauls out again.

Seafloor Hunters

Walrus hunt for food buried in the soft sediment on the seafloor, up to 600 feet down. They make many

DID YOU KNOW?

-  A walrus can eat thousands of prey items weighing 100 pounds or more in just one day!
-  Male walrus have a bone in their penis called the baculum. At up to 2 feet long, walrus have the largest penis bone of any mammal!
-  A walrus can feel and identify objects the size of a thumbnail just by brushing past them with its bristly lips.



◀ *Male walrus use their tusks as weapons to fight off other males and to maintain a particular territory on a beach or ice floe.*

WALRUS TUSK IVORY

Male walrus tusks grow up to 30 inches long and weigh up to 12 pounds. Walrus use their tusks mainly for display and fighting other walrus. Walrus are traditionally hunted by native people living

in the far north. All parts of the walrus body are useful, but the animal's tusks are the most valuable. Walrus ivory is of a finer quality than that of elephants and is often carved into ornaments and other items.

short dives to the bottom, where they plow along, using their sensitive, bristly lips to feel their way. Touch is by far the most useful sense in these dark, murky waters. When it finds something to eat, a walrus loosens it from the mud by squirting it with

jets of water from its mouth. The walrus swallows small items whole but it picks up large shellfish and sucks the meat out of the shell. Walrus feed mostly on clams, cockles, and mussels but also eat shrimps, crabs, and octopuses.

WEASELS, MINK, AND POLECATS

Sleek and agile, with lightning reactions and lethally sharp teeth, weasels and their relatives are formidable hunters. Most are capable of catching and killing prey considerably larger than themselves.





Weasels, mink, and polecats are born killers. They hunt all types of small animals, including mice, voles, rabbits, lizards, and birds. Weasels chase their prey over long distances, even following them into narrow burrows. Once captured, the prey stands little chance. If caught while running away, prey is usually killed with a single bite to the neck. If the prey turns to defend itself, the predator may go for the throat or belly instead. All weasel-like animals have extremely sharp teeth, with long canine teeth for stabbing and sharp-edged carnassial teeth for slicing meat. After making a kill, a weasel carries its prize to a private lair, where the prey is eaten, given to offspring, or stored.

Swimming and Climbing Hunters

Most species of weasels, mink, and polecats are good swimmers. Mink often live close to water and hunt frogs, fish, and crayfish, although they are just as good at hunting rabbits or voles. Polecats are especially good climbers and often raid the nests of birds and squirrels.

Weasels and their relatives have a long, slim body, short legs, and a short, pointed face. Most have a bushy tail, although in weasels especially the tail is short. Their backbone is extremely flexible, allowing the animal to take much longer strides than its short legs might suggest. Weasels, mink, and polecats make up for their short legs by sitting tall on their haunches to sniff the breeze or see over tall plants and bushes.

On the alert, a European polecat displays its pointed snout, sleek body, and bushy tail. Polecats are usually more stockily built and heavier than weasels.

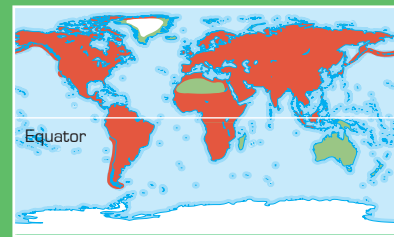
Fact File

WEASELS, MINK, AND POLECATS

Family: Mustelidae; subfamily Mustelinae (26 species)

Order: Carnivora

Where do they live? All continents, except Australia and Antarctica



Habitat: Extremely varied, including forests, mountains, tundra, semideserts, and farmland

Size: Head-body length 6–22 inches (15–55 cm); weight 1 ounce–7 pounds (30–3,200 g)



Coat: Usually shades of brown to black; may be two-toned, with paler underfur, or strikingly marked; some species change color seasonally

Diet: Small vertebrate and invertebrate animals

Breeding: Litters of 1–10 or more, born after 35–45 days' gestation; weaned at 6–18 weeks; mature at 4–12 months

Life span: Varies with species; 1–6 years in the wild, and up to 12 years in zoos

Status: 4 species are endangered and 1 species is vulnerable





THE FUR TRADE

White stoat fur, known as ermine, was once considered a symbol of purity and honor and was worn by European royalty and other rich people. Mink fur is also highly prized for its silky softness and warmth. Mink were once hunted for their fur, and now they are bred in fur farms. Many people consider the fur trade to be cruel. Escaped or released farm mink can cause huge problems for local wildlife. In the United Kingdom, for example, the native water vole is being hunted to the brink of extinction by introduced American mink.

🕒 *An ermine, or stoat, tries to escape from a cage. In fall, ermine shed their fur and develop a white winter coat.*

Territorial Travelers

Most weasels, mink, and polecats live alone, except females with babies. These animals are territorial and do not put up with another animal of the same species on their patch unless it is of the opposite sex. A few species, such as black-footed ferrets, grisons, and African striped weasels, sometimes seem to live in groups. However, they do not appear to help each other or work together in the same way that other social carnivores do, such as wolves or meerkats.

Male weasels, mink, and polecats travel widely during the breeding season, looking for females to mate with and fighting off other males. Females often mate with several different males, and the offspring in a single litter may have different fathers. The babies are born in a secure den, usually in a burrow lined with fur. They are small and weak, and their eyes stay shut tightly for at least three weeks. Female weasels often move their babies from one den to another to keep them safe, carrying them one by one in their mouth.



1. *African striped weasel*
2. *Marbled polecat*
3. *European polecat*
4. *Patagonian weasel*
5. *European weasel*
6. *American mink*




The young animals begin eating meat at around a month old and are fully weaned at three months. They leave home soon after that to find a territory of their own.

Threats and Conservation

Mink and weasels have a tricky relationship with people. Some species are treated as vermin because they sometimes kill livestock, but others are admired for their hunting skills. Ferrets, for example, are domesticated polecats that are bred to hunt rabbits. Some members of the family are highly threatened. The black-footed ferret of the American prairies is among the world's most endangered animals and has been saved from extinction only by a captive breeding program.

DID YOU KNOW?

-  A study in Finland showed that weasels killed more voles than any other predator.
-  American mink living in Europe have become smaller than those living in America and now look almost identical to native European mink.
-  There are only around 500 black-footed ferrets now alive. These animals are descended from a colony of just thirty animals found living in Wyoming in the 1970s.
-  All weasels, mink, and polecats have the habit of sitting up on their haunches for a better view.
-  The European mink is similar in appearance to the American mink but it is not closely related. In addition, the two species do not interbreed.
-  American mink are farmed extensively throughout the Americas, Europe, and Asia. The trade in mink fur is worth billions of dollars every year.

 Male weasels, mink, and polecats are usually much larger than females. This is especially true in the smaller species, such as the least weasel (above). The female (left) is only half the weight of the male.

WHALES AND DOLPHINS

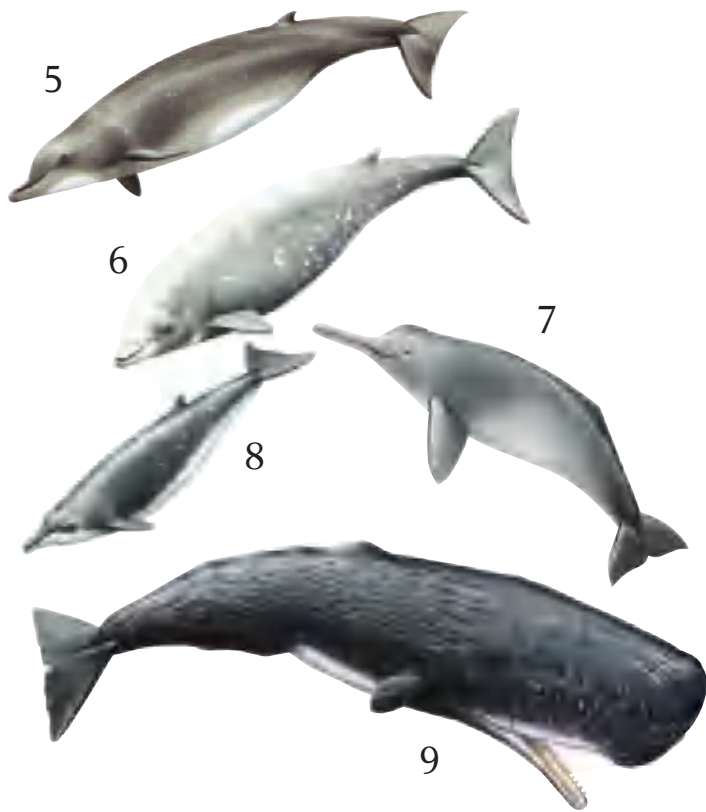
Whales, including dolphins, were once mistaken for fish because they have a similar body shape and cannot survive out of water. However, unlike fish, whales and dolphins breathe air, have warm blood, and give birth to live offspring, which they nurse on milk.

No other mammals are as perfectly adapted to life in water than whales and dolphins. Other mammals, such as seals and otters, are fine swimmers but they return to land to rest or breed. Dugongs and

TOOTHED WHALES

1. *Bottlenose whale*
2. *Dall's porpoise*
3. *Shepherd's beaked whale*
4. *Narwhal*
5. *Baird's beaked whale*
6. *Cuvier's beaked whale*
7. *Ganges river dolphin*
8. *Sowerby's beaked whale*
9. *Sperm whale*





manatees spend their whole lives in water but do not go far from the shallows. However, whales live in all the oceans and seas. They include several of the largest and most intelligent animals on the planet.

Whales and dolphins have a streamlined body, ending in a large tail with big, horizontal fins called flukes. Large muscles in the whale's back make the tail beat up and down, which moves the animal through the water. The front fins, or flippers, are used for steering, touching and caressing other whales, and for signaling. Most species also have a dorsal (back) fin, which acts as a keel to keep the animal steady.

👉 *Leaping high out of the water, a bottlenose dolphin reveals its sleek, muscular body. Dolphins may use this behavior to herd fish and attract mates.*

Fact File

TOOTHED WHALES

Families: 10 families (72 species)

Order: Cetacea; suborder Odontoceti

River dolphins: 4 species of freshwater dolphins from South America and Asia

Dolphins: 36 or more species of athletic, streamlined small- to medium-sized toothed whales; worldwide oceans and seas

Porpoises: 6 species; shallow and coastal seas

Beluga and narwhal: 2 species from the far northern waters

Sperm whales: The largest toothed whale, and the deepest diving of all cetaceans



Pygmy sperm whales: 2 species of small, toothed whales; temperate and tropical oceans

Beaked whales: 21 or more species of medium-to-large, toothed whales from deep waters

BALEEN WHALES

Families: 4 families (14 species)

Order: Cetacea; suborder Mysticeti

Gray whale: Coastal waters; usually heavily encrusted with barnacles

Rorquals: 9 species of groove-throated great whales, including the blue whale, the largest animal ever to have lived on Earth

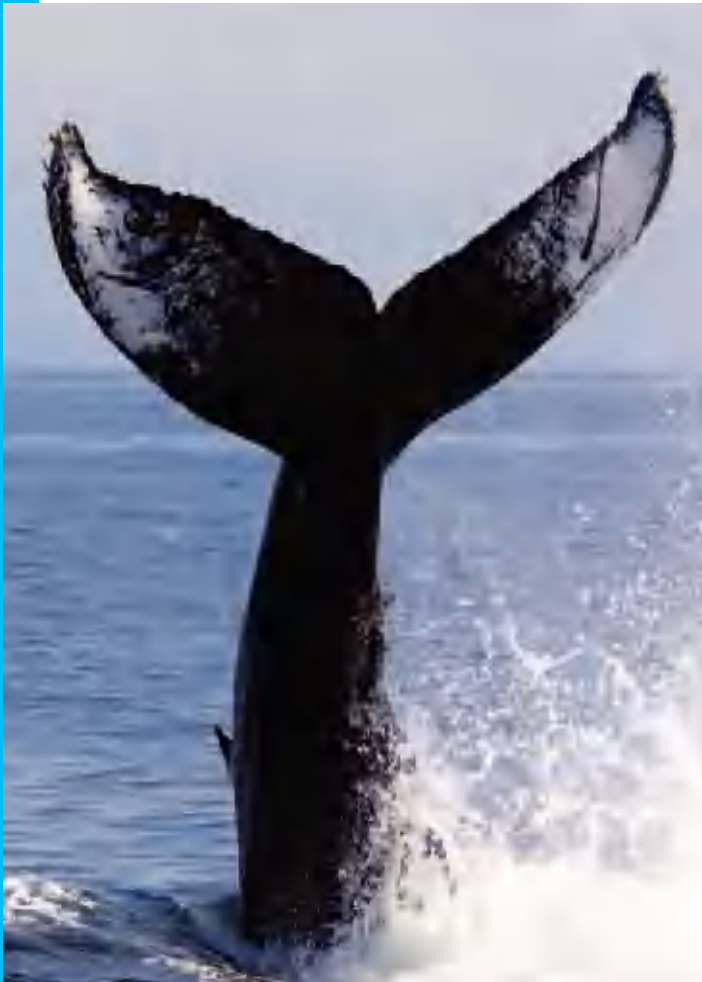
Right whales: 3 species from polar seas, with high-arching jaws

Pygmy right whale: 1 little-known species from the southern oceans




WHALES AND DOLPHINS

Teeth, Baleen, and Blubber

Whales and dolphins are split into two main groups, based on the way in which they catch their prey. Toothed whales have a narrow snout and jaw and conical teeth, with which they catch fish, squid, seals, and other whales. Baleen whales have a mouth full of stiff, bristly fringes called baleen, or whalebone. Baleen whales are filter feeders. They take huge quantities of water into the



DID YOU KNOW?


-  Dolphins have been trained to respond to hand signals and spoken commands from people, and they even understand some written symbols!
-  The fastest whale is the sei whale, which has been clocked at around 35 miles per hour!
-  A blue whale can take in 2,500 cubic feet of water in one gulp!

mouth and through the baleen. Small animals, such as shrimplike krill, are trapped by the baleen and swallowed.

Unlike most mammals, whales are not hairy or furry. Instead, they develop a thick layer of blubber (fat) under the skin, which acts as a layer of insulation to keep the animal warm in cold water. In warmer water, whales can have a problem with overheating. That is solved by a network of blood vessels in the skin. When the whale is too hot, these vessels bring blood to the surface, where it is cooled.

Diving Deep and Echolocation

Whales have to return to the surface because they breathe air, but many can make one breath last for an hour or more. Some whales dive to incredible depths to find food or to avoid

-  *A humpback whale dives in search of food. Northern humpbacks eat mainly fish, while the southern variety filter krill (tiny, shrimplike animals).*

predators. When a whale dives deep, its lungs are squashed by the water pressure, and air is forced into the windpipe. Oxygen and other gases can no longer pass into the whale's blood for distribution to the body. So, the whale's muscles have to use the oxygen already stored inside them in a substance called myoglobin.

For whales and dolphins, the most important sense is hearing. Sound travels much farther

through water than does light, especially in water that is cloudy or dark. Toothed whales send out pulses of sound produced in the nostrils. In a process called echolocation, the sound waves bounce off objects, and a whale's sensitive hearing picks up the echo. A whale's brain can change these echoes into a sound picture of its surroundings. The picture is so detailed that whales and dolphins can find their

WHALE EVOLUTION

The first whales appeared around fifty million years ago. They had four legs and were able to move around on land and in water. By forty million years ago, there were many different species of whales, which lived only in water. Their front legs had become flippers and the back legs had all but disappeared. Toothed and baleen whales emerged as separate groups thirty million years ago.



🔍 Experts have uncovered a whale's backbone. By analyzing the bones, scientists will be able to figure out what the whale's body form was like.

LOST AND STRANDED WHALES

Whales are usually extremely good at finding their way in the oceans. However, it seems that strandings and cases of whales becoming lost



and trapped in rivers or shallow bays are increasing. Conservationists think one reason for this might be sound pollution. Loud noises made by drilling operations or underwater explosions, for example, might cause these animals to flee in panic or to make serious mistakes in their navigation.

◀ *An enormous sperm whale lies stranded on a beach. The scars on its head might be from battles with giant squid.*

way around in pitch blackness and even find small fish buried in sand. Sound is also important in communication. Most toothed whales use clicking calls around other whales, and the larger baleen whales produce calls and songs that carry for hundreds of miles.

Summer Feeding and Winter Breeding

Small toothed whales, such as dolphins and beaked whales, live all around the world. Some live in social groups, while others live alone, but most seem to spend their life within a large home range. Baleen whales, however, are among nature's great travelers. For example, gray

whales, blue whales, and right whales spend their summers feeding in the polar waters of the Arctic and Antarctic but migrate to the warmth of the tropics in winter to breed.




Whales breed slowly, rearing just one calf at a time. Females of the smallest species, such as porpoises, may produce a calf every year, but larger whales may take several years to do so. To make up for this extremely slow breeding rate, large whales live for a long time—more than 100 years in the bowhead whale.

Whales have been hunted for centuries for meat, oil, and whalebone. By the early twentieth century, exploding harpoons and factory ships

meant more whales were killed than ever before, and several species were on the verge of extinction. Whaling was banned in 1986 by the International Whaling Commission, with just a few traditional hunts by arctic people still allowed. However, a few countries, such as Japan, Norway, and Iceland, continue to kill whales despite the ban.

Fortunately for the whales, there are now better ways to make money from whales other than hunting them. People have a deep interest in these mammals, and many people travel the world for a chance to watch whales swimming. In the United States alone, for

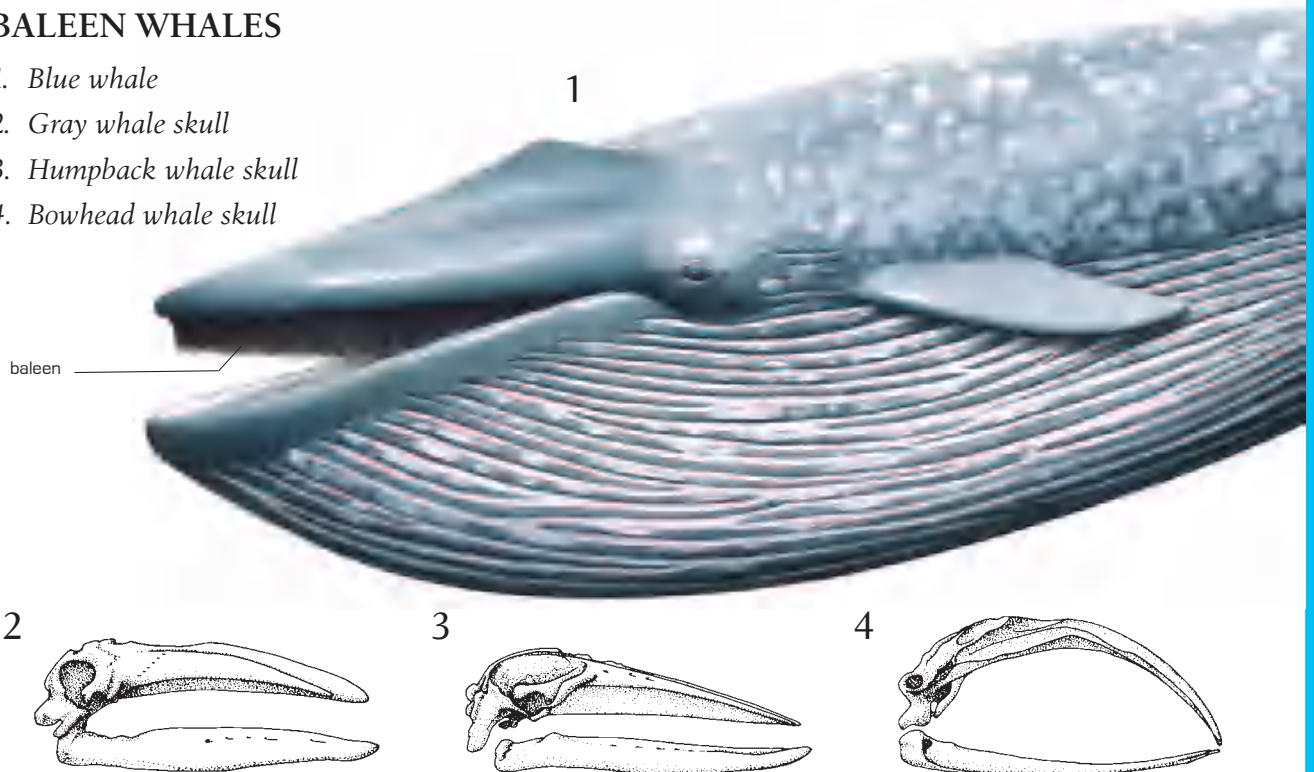
DID YOU KNOW?

-  The scientific word for whales and dolphins, *cetacea*, comes from the Greek word for whale, *ketos*.
-  Baleen is made of keratin, the same material that human hair and fingernails are made from!
-  The loudest call of any animal is the whistle of the blue whale, at 188 decibels!

example, the whale-watching industry makes more than \$1 billion a year. That amount of money is far more than could ever be made from simply hunting and killing whales.

BALEEN WHALES

1. *Blue whale*
2. *Gray whale skull*
3. *Humpback whale skull*
4. *Bowhead whale skull*



WILD CATTLE

Cattle are ideal farm animals because they are used to living in herds and do not fight over territory. They are now a familiar sight in most countries, but their wild cousins, spiral-horned antelope, include some of the world's most threatened animals.





Cattle and their close relatives are medium-to-large animals with a deep, powerful body, a long neck, and slim legs. Each foot has two toes with hard hooves. The tail is usually short with a tuft of long hair. Horns grow directly from the skull. They have a bony core that grows attached to the skull and are covered in an outer layer of protein called keratin, the same substance that makes human fingernails and hair. Unlike the antlers of deer, the horns of cattle and their relatives are not cast off each year. Instead, they grow larger and heavier with age. Most wild cattle have horns, although female spiral-horned antelope often do not have horns. Male Indian chousingha have four horns. In spiral-horned antelope, the way the keratin is produced forces the horns to grow in a spiral or corkscrew shape. This shape enables the animals to move more easily through dense forests and helps males lock horns when they are fighting. In some large wild cattle, the horns curve forward and are spiked.

Varied Habitats and Coats

Most wild cattle live in the open, on plains or open woodlands. Mountain-dwelling yaks have enlarged dew claws (extra digits) on their feet that help them grip the steep, often snowy ground. Spiral-horned antelope live in many different habitats, from savannas (eland) and reed beds (sitatungas), to forests (nyala) and dry woodlands and scrublands (kudus).

An American plains bison grazes peacefully. In the early nineteenth century, people killed so many of these bison that they almost became extinct.

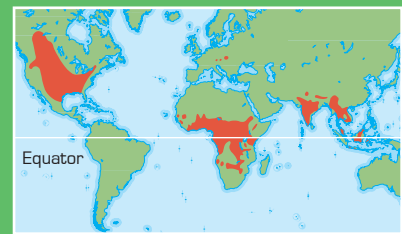
Fact File

WILD CATTLE AND SPIRAL-HORNED ANTELOPE

Family: Bovidae; subfamily Bovinae (24 species)

Order: Artiodactyla

Where do they live? North America, Africa, central Europe, South Asia, and Southeast Asia



Habitat: Grassy plains, mountain pastures, and forests

Size: Head-body length 3 feet 4 inches–11 feet



(1–3.4 m); weight 44 pounds–1.2 tons (20–1,200 kg)

Coat: From short and sleek to long and shaggy or woolly; usually brown or black; may be boldly marked

Diet: Mainly grass for cattle; antelope eat wide variety of plants

Breeding: 1 calf born after 220–340 days' gestation; mature at 1–2 years

Life span: 10 years in the wild, and 25 to 30 years in captivity

Status: Almost all are threatened; 7 species are endangered; 2 species are critically endangered

WILD CATTLE

Most wild cattle have a short, sleek coat, but bison and yaks often have a shaggy, woolly coat. In spiral-horned antelope, the color of the coat usually matches the landscape. The animal often has camouflage markings that help it melt into the background. In cool climates, being large and growing a thick coat helps keep the cattle warm. In the tropics, large species such as water buffalo can become too warm. To help keep cool, they often wallow in mud. That also helps remove parasites, such as ticks and fleas, from the skin and coat.

Grazing and Browsing Ruminants

Cattle are mainly vegetarian, although some species such as yaks eat almost anything to survive. Cattle graze grass, while spiral-horned antelope browse on leaves, shoots, and buds on shrubs and trees. All species have large cheek teeth that work like millstones to grind grass and other plant matter. The tongue is long and can be used to grip shoots or clumps of grass.

Grass does not contain many nutrients, so cattle must eat a lot of

DID YOU KNOW?

-  In winter, the Himalayan yak can survive temperatures as low as -40°F !
-  Bison are the largest land-dwelling animals in the Americas and Europe.
-  An American bison eats up to 65 pounds of grass every single day!





SHOWING OFF

Male cattle are usually larger than females, and in some species they have a mane or fringe of long hair along the neck, throat, and chest that makes them look even bigger. Rival males display to each other, showing off their size and horns or drawing attention to themselves by bellowing. Rivals that seem closely matched may begin tussling with locked horns. They test each other's strength, and a tussle may end up in a full fight, in which the males try to stab each other with their horns.



1. *Nilgai*
 2. *Common eland*
 3. *Kouprey*
 4. *Saola*
 5. *Wild water buffalo*
 6. *American bison*
 7. *Auroch (now extinct)*
- it and digest it very well to survive.
- Cattle are ruminants—they chew their food twice. They start by giving the grass a quick chew and swallowing it. In the large stomach, the grass becomes mixed with bacteria (single-celled microorganisms) that help break it down. After a while, the grass is coughed back up into the animal's mouth. It is then chewed again to make sure the bacteria are really well mixed in, before being swallowed again.

Migrations and Herd Life

Most wild cattle and spiral-horned antelope are wanderers. Species such as yaks and American bison may make long migrations (return journeys) as the seasons change. Most cattle and spiral-horned antelope live in groups, or herds. The few species that live alone, such as anoas of Indonesia and the recently discovered saola, or Vu Quang ox, are shy forest animals that are seldom seen.

WILD CATTLE

There are two types of herds—nursery herds and bachelor herds. Nursery herds contain adult females and their calves and are usually led by a single male, who keeps all other adult males away. Young females usually stay in the same herd for life. Young males leave nursery herds to form bachelor herds.

With many eyes and ears checking for danger, life in a herd is safer for most cattle. In some species, the protection is so good that even blind or lame animals can survive perfectly

🔺 *A yak's thick, hairy coat helps it keep warm in its extremely cold habitat.*

well. If a musk ox or African buffalo herd is attacked by predators, such as lions or wolves, the rest of the herd will turn on the attackers. They begin by lowering their huge horns and usually drive away the predator.

Seasonal Breeders

Most wild cattle breed seasonally, and calves are usually born in spring or at the start of the rainy season when there is plenty of fresh new plant growth. Females usually have only one calf. Twins are rare, except in domesticated (farmed) breeds.

People have hunted several species of wild cattle, such as the American

DID YOU KNOW?

- 🐾 Kudu and eland can leap over objects up to 6 feet high from a standing start!
- 🐾 The horns of the male greater kudu and the giant eland grow to more than 40 inches long!
- 🐾 The kouprey was discovered in the late 1930s, while the saola was discovered only in the early 1990s!





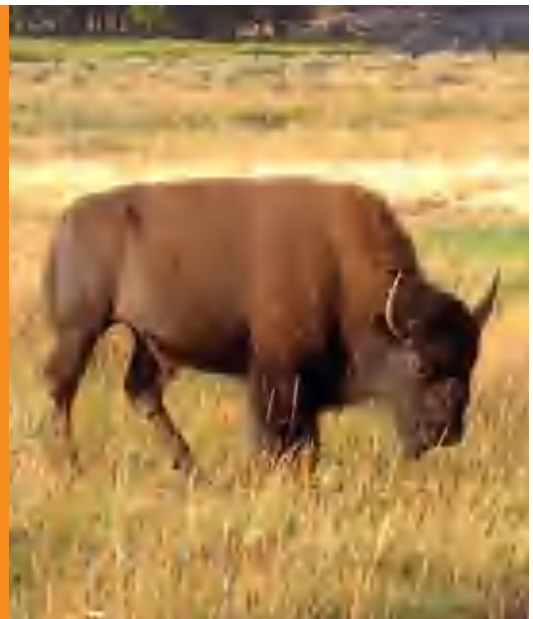
bison, to the brink of extinction, while other species have been domesticated and spread all over the world by people. There are around 1.2 billion domestic cattle and twelve million yaks. However, the auroch, the wild ancestor of domestic cattle, is extinct, and wild yaks are vulnerable to extinction.

📌 *The horns of a male greater kudu can grow to more than 3 feet long, when measured in a straight line.*

📌 *Most American bison now live safely in protected parks and preserves, such as Yellowstone National Park.*

SAVING THE AMERICAN BISON

Before European settlers came to America, there were tens of millions of bison living on the great plains of the Midwest. As settlers spread, they set about hunting these vast herds, for their meat and hide, for sport, and—perhaps worst of all—as a way of destroying the livelihood of Native American tribes. By 1887, there were just 541 bison left. The species was saved by intensive conservation efforts and it now seems secure, with around 150,000 bison living in the wild, mostly in parks and game preserves.



WILD PIGS AND BOARS

Pigs may not be graceful or beautiful, but they are strong, energetic, and smart. They are able to survive in almost all forest habitats and have become familiar as domestic (farm) animals all over the world.





Pigs are fairly large mammals with a powerful, barrel-shaped body, a large, pointed head, and slim legs. This shape is ideal for barging through thick bushes and trees; most wild pigs live in forests. The African warthog is an exception because it lives in open woodlands and savannas (tropical grasslands). Pigs can run fast and swim well. The tail is thin and usually short. The body is covered with a sparse coat of bristly hair, and some species have a shaggy mane. Pigs and hogs have four toes on each foot. The middle two toes are used for walking and have small hooves called trotters. The outer toes form small dew claws.

Pigs have a snout with a disk at the end. Males have large tusks, which are kept sharp by rubbing against each other. In the babirusa, the curved upper tusks grow through the roof of the mouth and poke out of the top of the snout. These long teeth are of no use for feeding, but males fight with them, ramming each other with them or trying to hook and snap each other's tusks. In warthogs and warty pigs, the face has several fleshy warts, which protect the eyes and face when the animals fight. Females seem to be attracted to the males with the largest warts.

Rooting for Food and Wallowing

Pigs do not usually have good eyesight but their senses of hearing and smell are extremely sharp. They are particularly good at sniffing out food, rummaging

This old warthog has an impressive collection of sharp tusks and large facial warts. In fights with other warthogs, the warts help protect the head.

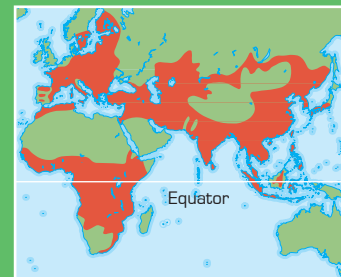
Fact File

WILD PIGS AND BOARS

Family: Suidae (up to 16 species)

Order: Artiodactyla

Where do they live? Europe, Africa, and Asia; also introduced to other continents



Habitat: Forests, woodlands, and savannas

Size: Head-body length 23–83 inches (58–210 cm); weight 13–605 pounds (6–275 kg)

Coat: Thin, coarse hair; black, brown, or gray; skin usually colored



Diet: Omnivorous—almost anything that can be eaten

Breeding: Litters of 1–12, born after 100–175 days' gestation; weaned at about 3 months; mature at 18 months

Life span: 15–20 years in most species; 24 years in the babirusa

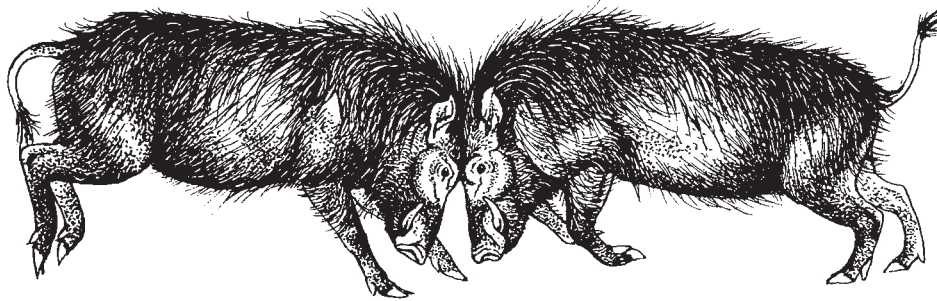
Status: 5 species are threatened

WILD PIGS AND BOARS

around on the ground with their snout and sometimes by digging. They eat all kinds of plant and animal food, including: fruit; leaves; roots; tubers; fungi; invertebrates, such as snails, earthworms, and insect grubs; birds; lizards; small mammals; and eggs.

All pigs appear to enjoy wallowing in mud and water. In hot weather, that behavior helps them stay cool and prevents sunburn. Even in cooler climates, these animals cake themselves in mud, which may help get rid of grease, dead skin, flies, and parasites.

1



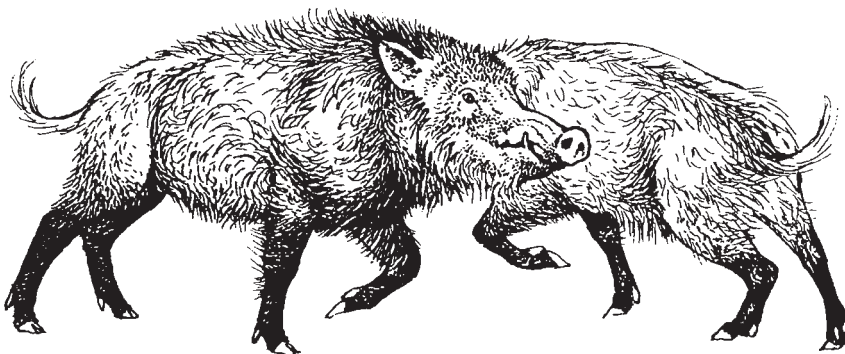
1 When fighting, giant forest hogs clash together the top of their toughened head.

2



2 Fighting bushpigs cross their snouts, somewhat like swords. These wild pigs have large facial warts that protect them.

3



3 Wild boars slash at each other's shoulders with their sharp tusks. The thickened skin and matted hair on the shoulders help provide some protection.



DOMESTICATING PIGS

Pigs were probably first domesticated (farmed) around 10,000 years ago in Asia. Pigs are ideal domestic animals because they are easy to breed and grow fast, eating scraps and leftovers. There are now almost 900 million domesticated pigs, all of which have descended from the wild boar. In many parts of the world, domestic pigs have been released or escaped into the wild. These feral pigs can be serious pests, threatening native wildlife and damaging natural habitats.



Breeding Groups




Wild pigs usually live in groups for much of the time. Groups containing females and piglets are called sounders. Bands of males are called bachelor groups. Both males (boars) and females (sows) can breed at around eighteen months old. Yet, boars are not often successful until they are three or four years old because they need to be big and strong enough to fight off other males.

Breeding can take place throughout the year in tropical forest species. Warthogs and wild boars breed so that the piglets arrive in the rainy season or in spring, when there is

plenty of food. Piglets are usually born in a rough nest of grass or trampled plants. Female warthogs use an underground den. Most piglets have bold, striped markings that help camouflage them. They begin to leave the nest to explore with their mother after around ten days.

Pigs have been introduced to a great many places outside their natural range. Domestic and feral descendants of wild boars live on all continents, except Antarctica, and on many islands, including Madagascar and New Zealand. Feral pigs are once-domesticated pigs that have been released back into the wild.

DID YOU KNOW?

-  In 2003, a domesticated sow in the United Kingdom gave birth to 27 piglets in a single litter!
-  The largest pig is the giant forest hog, while the smallest is the pygmy hog.
-  Wild boars clatter their teeth together to make a rattling sound when they are angry!

WOLVERINE

Wolverines have a well-deserved reputation as brazen thieves. They are fierce, bold, and above all they make the most of things. In the harsh, snowy landscapes of the far north, wolverines have learned never to miss out on the chance of a free meal.





Wolverines are members of the weasel family, although their large size means they are sometimes mistaken for dogs or even small bears. Like weasels, wolverines are fierce hunters and immensely strong for their size. They attack prey much larger than themselves, including roe deer, reindeer, sheep, and even moose. Smaller prey, such as lemmings, grouse, and hares, are taken as snacks. Wolverines also eat carrion (dead animals) and are great scavengers. Wolverines think nothing of stealing meat from other predators, such as foxes and birds of prey, and can even drive off larger animals, such as pumas and bears.

Like other weasel-type animals, wolverines have a long body and relatively short legs. The feet are broad enough to act as snowshoes, spreading the wolverine's weight over a wide area so that it can run lightly over snow. Each foot has five toes, each with a long, curved claw. A wolverine can gallop for miles without resting and may cover 30 miles a day in its search for food.

Hunters in the Snow

Wolverines are excellent climbers and can swim well. They are also good diggers. Their strong claws loosen packed snow, and their wide feet shovel the snow aside. Wolverines use tunnels in the snow as dens and larders for storing food. A fully grown wolverine can drag the body of large deer over several miles to store it in a safe place such as a snow hole or in the fork of

Snarling ferociously, a wolverine protects its territory from intruders. A wolverine's strong teeth and large jaw muscles give it an extremely powerful bite.

Fact File

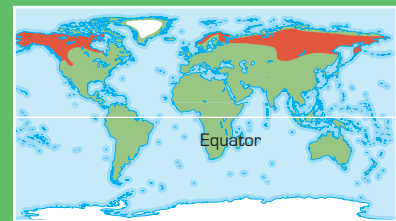
WOLVERINE

Gulo gulo

Family: Mustelidae

Order: Carnivora

Where do they live? Far north of North America and Eurasia



Habitat: Tundra and taiga forests

Size: Head-body length
26–37 inches (65–95 cm);
weight 15–70 pounds
(7–32 kg)



Coat: Extremely thick, with long, mostly dark brown fur; paler areas on face and flanks; bushy tail

Diet: Meat, mainly deer, including smaller mammals, birds, and carrion; some plants

Breeding: 1–5 offspring, born after 9 months' gestation; weaned at 8–10 weeks; mature at 14–18 months

Life span: Up to 17 years

Status: Vulnerable and heavily persecuted



WOLVERINE

a tree. The wolverine may eat the stored meat over the next few days or leave it hidden for up to six months. Females often store food while they are pregnant and then feed it to their cubs.

Territorial Loners

Wolverines live alone. They mark their territory with urine and scent from glands under the tail. Males have the largest territory, which can be up to 600 square miles. A male's



◀ *Somewhat bearlike in appearance, the wolverine is far smaller than any bear. Its large feet act like snowshoes, spreading its weight and allowing it to run over soft, deep snow.*

KILLERS ON THE LOOSE

Wolverines have had a bad reputation in most parts of their range. In many countries they are still shot and trapped by farmers and gamekeepers. They are killed mainly to protect livestock—wolverines

are reported to kill 13,500 sheep and 18,000 farmed reindeer in Norway and Sweden every year. However, wolverines are now threatened themselves, and some populations are now protected by local laws.




territory usually overlaps the territories of several females.




Wolverines mate in late spring or summer. However, the embryos (developing babies) do not begin to develop inside the females until midwinter. It takes only forty days for a wolverine to develop enough to be born. However, the female's body puts the pregnancy on hold for several months, so the cubs are not born until early spring. By the time the cubs are ready to hunt and eat solid food, animals such as deer and hares have also begun to breed, so there is plenty of prey available.

Young wolverines may be born in a cave or rocky crevice, in the burrow of another animal, or in a

snow den. From time to time, the mother moves her cubs to another den, especially if the first den is disturbed. The cubs stay with their mother for around a year before leaving to find their own territory and set up home elsewhere.

 *This wolverine is on the lookout for prey. In winter, wolverines kill or scavenge caribou (reindeer), which they find using their keen sense of smell.*

DID YOU KNOW?

-  The old-fashioned name for a wolverine is *glutton* because of its seemingly greedy habits!
-  The wolverine appears in many Native American myths about the spirit world.
-  Wolverine fur does not collect ice, so it is used by arctic people to line and trim the hoods of parka-style winter coats!

WOLVES

Intelligent and sociable, wolves are among the world's most successful carnivores. But, despite being the ancestors of dogs, the wolves' relationship with people is a complicated mixture of fear and admiration, love and hate.





Pet dogs love to take part in all sorts of activities with their human companions. With the right training, dogs will do almost anything to please their master or mistress. This behavior comes naturally to domestic dogs because they are descended from wolves, which are among the most social of all mammals. Wolves live in groups and depend on teamwork to survive. Each wolf knows its place in a pack, and there are strict rules about how to behave. The pack is led by a male and female wolf, called the alpha pair.

Wolves in Trouble

The gray wolf is the largest species in the dog family and the most widespread mammal species after humans. It once lived throughout North America, Europe, and Asia, everywhere but in the driest deserts and thickest forests. The American red wolf has a much smaller range. In 1975, red wolves became officially extinct in the wild. The last known red wolf pack was rounded up in the swamplands of Louisiana and taken into captivity for its own protection. These few animals were bred in zoos, and in 1987 they began to be returned to the wild in special preserves. There are now around 250 red wolves, 200 of which are still in captivity. It is too soon to say if they will ever recover.

Red wolves look like a cross between a gray wolf and a coyote, and many biologists think this is exactly what they are. If the red wolf is proved to be such a hybrid

A gray wolf howls to communicate with the rest of its pack and to warn off neighboring packs. This behavior reduces the chances of rival packs fighting.

Fact File

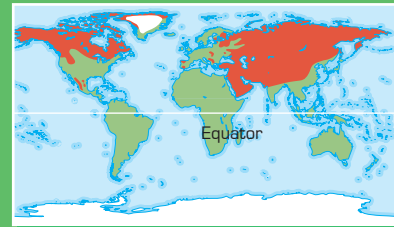
WOLVES

***Canis lupus* (gray wolf) and *Canis rufus* (red wolf)**

Family: Canidae (2 species; 7 Eurasian and 5 North American subspecies, or local types)

Order: Carnivora

Where do they live? North America, Europe, and Asia; naturalized in Australia as the dingo



Habitat: Forests, tundra, mountains, scrublands, and deserts

Size: Head-body length 40–58 inches (100–150 cm); weight 27–165 pounds (12–75 kg)



Coat: Fluffy or shaggy; varies in thickness with habitat; color from near-white, through gray, buff, tawny, and black; paler on chest and belly

Diet: Meat




Breeding: Litters of up to 11 cubs, born after 61–63 days' gestation; weaned at 5 weeks; mature at 22 months

Life span: 8–16 years in the wild, and 20 years in zoos

Status: Red wolf is critically endangered

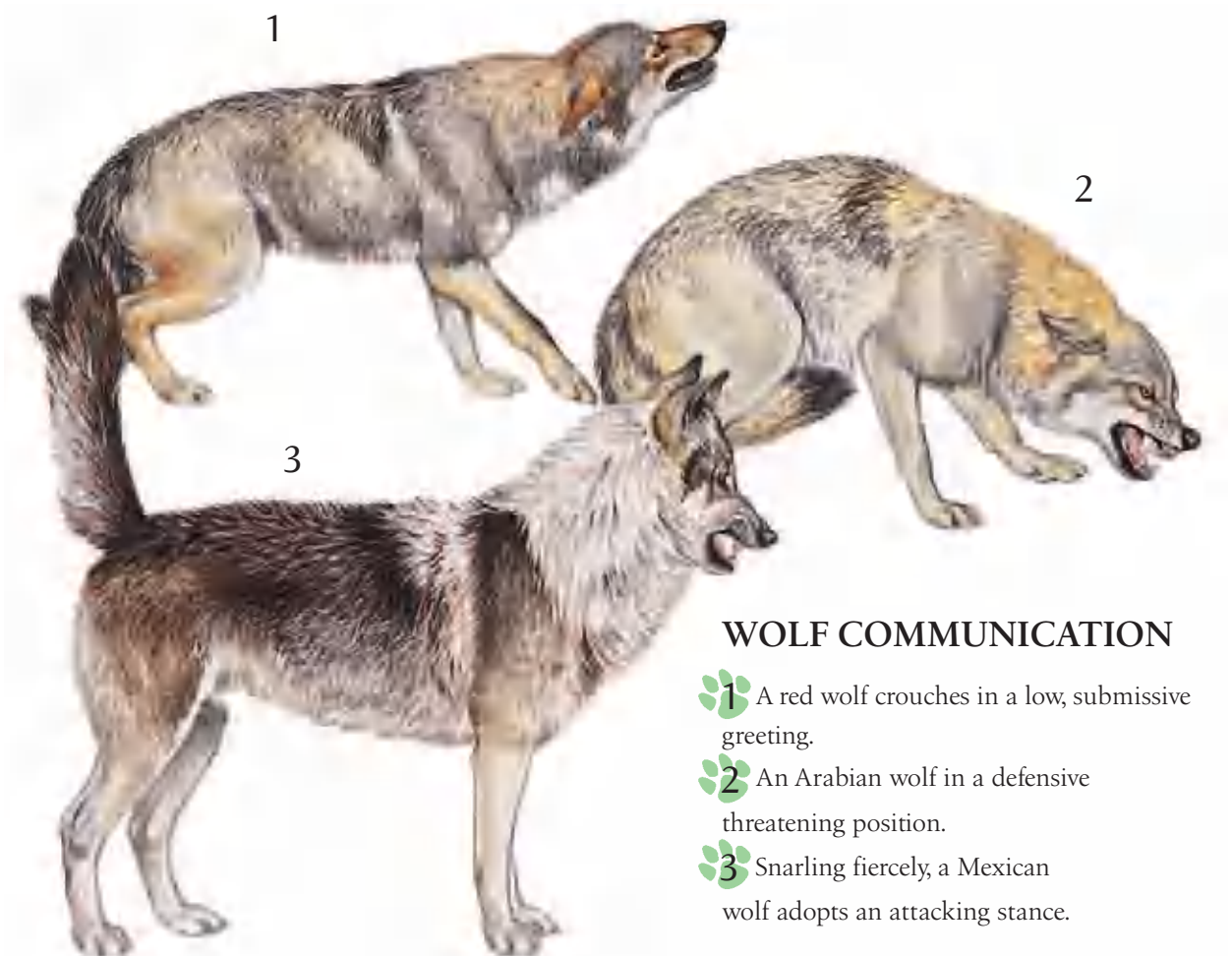


DID YOU KNOW?




-  A large wolf can gobble up to 20 pounds of meat in one meal, after which it will not need to eat for days!
-  Gray wolves became extinct in the United Kingdom in the eighteenth century. Some people think they should be reintroduced to Scotland.
-  The Mexican gray wolf is officially extinct in the wild, although there are a few surviving in zoos.

rather than a separate wolf species, it may be less likely to be properly protected in future.

Gray wolves are not in quite such serious trouble as red wolves, but they have become extinct in many countries where they once lived. In addition, they are still shot, poisoned, and trapped in many parts of the world. They are usually killed to protect livestock, but there



WOLF COMMUNICATION

-  1 A red wolf crouches in a low, submissive greeting.
-  2 An Arabian wolf in a defensive threatening position.
-  3 Snarling fiercely, a Mexican wolf adopts an attacking stance.



is also money to be made from their fur. By the mid-twentieth century, wolves were all but extinct in western Europe and gone from most of the United States, except Alaska.

Wolves Around the World

In 1995, conservationists released thirty-one Canadian gray wolves into Yellowstone National Park. The park has plenty of deer for the wolves to hunt and they have done very well. Sometimes these wolves also take livestock, but farmers are paid for any cattle or sheep that are killed and are allowed to shoot wolves that cause a problem on their land.

Wolves are also making a slow comeback in Europe, with increasing populations in countries such as Italy, France, Romania, and Norway. Wolves are protected in most European countries, but they are still hunted in others, such as Spain and Greece.

Gray wolves from different parts of the world look and behave quite differently, despite belonging to the same species. Canadian timber wolves are extremely large, with a thick, fluffy coat. They live in packs of up to twenty and hunt large prey, such as elk. Gray wolves in the Middle East



WOLF FOLKLORE

People have always been fascinated by wolves, which appear worldwide in myths and folktales. Some stories, such as Aesop's fables, highlight the wolf's cunning, others such as the tale of Red Riding Hood portray wolves as big, bad and dangerous to know. However, there are also plenty of stories showing a gentle side to wolves. Many of these tales are of children being cared for by wolves. The most famous is the story of Romulus and Remus, twin boys supposedly raised by a female wolf (above) and who went on to found the ancient city of Rome.

are much smaller and slimmer, with a thin, straggly coat. They live in much smaller packs and often hunt alone for small prey or scavenge for dead animals and rubbish.



THE AUSTRALIAN DINGO

Most biologists think that the Australian dingo is descended from the Indian gray wolf, while others say it is descended from the domestic dog. However, since all domestic dogs are descended from wolves, it does not make much difference. What seems certain is that people brought dingoes to Australia from Asia, probably around 3,500 years ago. Dingoes soon became fully wild again and spread throughout the country. They never reached the island of Tasmania, and they are now strictly controlled in many areas by fencing, shooting, and poisoning.

Hunting and Breeding

Not all wolf hunts are successful. More than 90 percent of prey that are chased manage to escape, and wolves often go for several days without food. Usually the prey they do catch are old or weak. Livestock such as sheep and cattle are sometimes killed, but despite their bad reputation, healthy wolves hardly ever attack people.

Only the alpha pair in a wolf pack are allowed to breed. The other members of the pack are usually the sons and daughters of the alpha pair. They stay with their parents for one or two years. They help with hunting, feeding, protecting the younger cubs, and defending the pack's territory.

Hunting and Breeding




As a team, a wolf pack travels around its territory, leaving scent marks on trees and scratches on the ground to show that they own it. The pack also joins in howling sessions. Their howls carry for up to 10 miles in still air and let all the other wolves in the area know that the pack is there. Each of these signals ensure that wolves from different packs do not often meet. If they do, there may be a fierce fight.




Leaving Home

Most young wolves leave home before they are two years old. By this time they have learned all they need to know from their parents about hunting, and they have had some practice at looking after cubs. They move away in search of a mate and a territory of their own. This is a dangerous time, and lone wolves avoid meeting with other packs.

DID YOU KNOW?

-  Domestic dogs are directly descended from the gray wolf. People began domesticating wolves around 12,000 years ago!
-  Tundra wolf packs have home ranges covering thousands of square miles, and they may travel hundreds of miles a week in search of food!
-  Lone wolves do not howl because they do not want to draw attention to themselves.

 A red wolf runs past its den. These wolves are critically endangered and are protected in special preserves.



WOMBATS

Wombats are large burrowing animals, but unlike other great diggers, they eat little and have a slow and steady lifestyle that saves energy. Like other marsupials, wombats are born early in their development and are nursed in a pouch.





Australia's wombats are the world's largest burrowing mammals. They look like small, stout bears, but wombats are the closest living relatives of koalas. There are three species of wombats. The common wombat has a moist, black nose and coarse fur, while the northern and southern hairy-nosed wombats have a furry nose and short, silky fur.

Powerful Diggers

All wombats are superb diggers. They have short, powerful legs and long, thick, blunt claws that loosen even the hardest baked soils. Wombats scrape the soil under their body as they dig and shove it out of the burrow with their rear end. Most burrows are simple tunnels with a sleeping chamber at the end, but some older burrows have branching tunnels and several entrances. A single wombat can have several burrows on its home range and visits a different one every few nights. Burrows offer shelter from the sun's heat, the cold night air, and predators. Wombats have few enemies, but dingoes and eagles may attack the babies. Wombats can fight back with surprising ferocity if attacked.

Common wombats usually live alone. They mark their territory with droppings and scent marks on rocks and other obvious landmarks. In some areas, it seems neighboring wombats may sometimes visit one another's territory and even use the same burrows, although not at the same time. Unlike the common

A common wombat trots across the grass. Wombats are built for a burrowing lifestyle, with their sturdy body, broad shoulders, and massive, clawed forepaws.

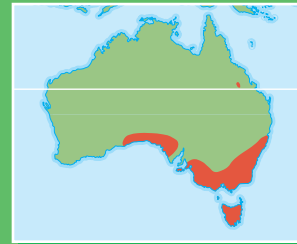
Fact File

WOMBATS

Family: Vombatidae (3 species)

Order: Diprotodontia

Where do they live? Southern and eastern Australia, and Tasmania



Habitat: Forests, woodlands, heaths, dry grasslands, and scrublands; usually on sandy soils

Size: Head-body length 35–45 inches (90–115 cm); weight 48–86 pounds (22–39 kg)



Coat: Thin and coarse or short and silky; dull grayish brown to black

Diet: Grass and the leaves, roots, and shoots of other plants

Breeding: 1 offspring, born after just 21 days' gestation; nursed in pouch for 6–10 months; weaned at 12 months; mature at 2 years

Life span: Up to 30 years

Status: Northern hairy-nosed wombat is critically endangered; other 2 species are lower risk



WOMBATS

wombat, the two species of hairy-nosed wombats live in groups, with several adults sharing a system of burrows, like a giant rabbit warren.

Eating and Energy

Digging is hard work and uses a lot of energy, but wombats manage to dig on a low-energy diet of grass and other plants. They often have to dig for their food, too, especially in dry weather, but rarely spend more than a couple of hours a day feeding. All

of their food is tough and usually covered in grit. That means there is a lot of wear and tear on the wombat's teeth. To make up for the steady wearing down, a wombat's teeth continue to grow throughout its life.

Wombats spend a long time digesting their food. It takes almost three days for a meal of grass to pass all the way through a wombat's digestive system. That allows plenty of time for every last morsel of goodness to be absorbed from the

▶ *This common wombat has a wide head and thick neck, which helps it burrow through extremely hard soil.*





SAVING THE NORTHERN HAIRY-NOSED WOMBAT

The northern hairy-nosed wombat (above) is one of the world's most threatened mammals. In 1980, there were thought to be just thirty-five of these animals left, all living in a single preserve in Epping Forest National Park in Queensland, northern Australia. Since then, these wombats have been closely guarded and their numbers have grown to around seventy. That is still not enough to ensure their survival, but there are plans to speed their recovery with a captive breeding program.

food. Plant material is difficult to digest, and so wombats have bacteria (single-celled microorganisms) in their gut that help digestion.

The bacteria break down cellulose, a tough material present in all plants, into sugar. Wombats also have glands in the stomach that produce juices that help break down the toxins (poisons) produced by some plants. Even with all this careful digestion, a

wombat's diet does not provide it with much energy to spare. When they are not digging, wombats spend almost all of their time resting. They usually move around slowly and avoid overheating in summer by dozing in their burrows. In winter, they bask in the sun so that they do not have to use energy to keep warm.

Pouch-reared Babies

Female wombats raise just one youngster at a time, carrying it inside a pouch, just as most marsupials do. However, unlike kangaroos, a wombat's pouch opens backward, so it does not fill with soil as the animal digs. The youngster stays in the pouch attached to a teat for three months, after which it begins to explore the world outside, returning to the pouch to feed and rest.

DID YOU KNOW?



A wombat's metabolism (body processes) burns less than half as much energy as that of most other mammals of a similar size.



Wombats do not hibernate but they may spend several days at a time just resting in their burrow.



Early European settlers in Australia called the wombat a badger because of its burrowing habits!

GLOSSARY

aquatic Water living

arboreal Tree living

arctic Of, or relating to, the north pole or the surrounding region

bacterium (plural: bacteria)

Single-celled microorganism

baleen Horny, curtainlike substance that hangs from the upper jaw of baleen whales; filters krill out of the seawater

biome Major zone of the living world, such as rain forest, desert, and temperate forest; each biome has its own distinctive climate and living organisms

browse To feed on the buds, shoots, leaves, and twigs of shrubs, bushes, and trees

bull The male of certain species, such as elephants, seals, and whales

bush meat The meat of wild animals hunted by local people to eat or sell

camouflage Pattern of coloration that allows an animal to blend in with its surroundings

canid Member of the family Canidae, such as coyote, dingo, fox, and wolf

carnassial tooth One of the two strong, pointed, slicing cheek teeth of most carnivores

carnivore Meat eater; animal that catches other animals for food

carrion Dead and decaying animal flesh eaten by other animals

cellulose Tough substance that makes up the cell walls of plants

class Major category in taxonomy ranking above order and below phylum

classification Organization of different organisms into related groups by biologists

climate Average weather conditions (temperature, wind, and rain) over a period of years

coniferous forest Area of cone-bearing trees that grow mainly in cold regions of the northern hemisphere

crustacean Water-living creature (for example, crab, water flea, and shrimp)

cud Food brought up from the stomach for a second chewing, usually by plant eaters such as cows and sheep

desert Major biome, or type of ecological community, covering around one-seventh of Earth's surface; has few plants and less than 10 inches of rainfall each year; hot or cold region that is extremely dry

dew claw Extra digit ("finger" or "toe")

digestion The breakdown of food into small, easily absorbed molecules in the digestive system

DNA Deoxyribonucleic acid; present in the cell nuclei of a living organism; carries inherited genes

domesticated Farmed

dominant Highest-ranking

dormant Being in a state of suspended biological activity

echolocation Use of sound echoes to build a picture of the surroundings by animals such as bats and dolphins

ectotherm Cold-blooded animal; *see also* endotherm

embryo Early stage of a mammal while it is inside the mother's womb

endangered species Any species that is extremely close to becoming extinct in the wild

endotherm Warm-blooded animal; *see also* ectotherm

equator An imaginary line around the widest part of Earth that is equally distant from the north and south poles and which divides the surface equally into the northern and southern hemispheres

estivation An animal's sleeplike resting state in summer to avoid heat and drought; *see also* hibernation

Eurasia Europe and Asia

evolution The way in which species of living organisms change over long periods of time





extinct Any species that has not been found in the wild for an extremely long time and which is therefore thought to have disappeared forever

extinction Death of a species of living organism

family Group of related living organisms forming a category ranking above a genus and below an order

feces Expelled waste products of digestion

feral Wild animal descended from a domesticated animal that returned to the wild

fossil Evidence of past life preserved in tar, peat, amber, rock, or volcanic ash

gene Section of DNA that codes for one inherited characteristic

genus Group of closely related species

gestation The time an animal spends developing inside its mother (pregnancy)

habitat Type of place in which an animal or plant usually lives or grows

herbivore Plant-eating animal

hibernation To spend the winter in an inactive, or dormant, sleeplike state; *see also* estivation

home range Area usually covered by an individual animal during a particular period of its life; *see also* range

insectivore Insect-eating mammal, such as an aardvark or anteater

invertebrate Animal without a backbone

joey Young kangaroo or wallaby

krill Shrimplike, planktonic animal life that floats in the oceans and forms the main food of baleen whales

litter Multiple offspring of a single pregnancy

mammary gland Milk-producing gland present in the skin of mammals

metabolism The chemical changes in living cells that provide energy for essential life processes such as growth and repair

migration Seasonal, long-distance journey by animals, such as wildebeests and whales, often to feed or breed

molt Shed (as in coat)

New World Geographical term referring to the western hemisphere, particularly North, Central, and South America; *see also* Old World

niche A lifestyle particular to a specific species

nocturnal Active at night

northern hemisphere Half of Earth north of the equator

nutrient Food vital for an animal's chemical life processes

Old World Geographical term referring to the eastern hemisphere, comprising Europe, Africa, and Asia; *see also* New World

omnivore Mammal that eats both plants and animals

order Category of taxonomic classification ranking above family and below class

phylum Category of taxonomic classification ranking above class and below kingdom

placenta Temporary organ that develops in the womb to allow a mammalian embryo to obtain nourishment from the mother during gestation

plankton Microscopic animal and plantlike life in the ocean

pollination Transfer of pollen from the male to the female parts of a flower

predator Animal that kills and eats other animals

prehensile Grasping (as in digit or tail)

prey Animal caught and eaten by another animal

primate Member of the mammalian order Primates; includes apes, bush babies (galagos), humans, lemurs, lorises, monkeys, pottos, and tarsiers

rain forest Major biome, mostly in the tropics; high annual rainfall; tall, fast-growing trees that form an overhead canopy; daytime temperature is usually 90°F; annual rainfall is greater than 70 inches

range Geographic area within which members of a species usually live; *see also* home range

rodent Member of the order Rodentia, including agoutis, beavers, capybaras, guinea pigs, hamsters, mice, rats, squirrels, and voles

rumen Large first compartment of a ruminant's stomach, which contains microorganisms that break down cellulose

ruminant Mammal that chews the cud; for example, camels, cows, and sheep

saliva Watery mouth secretion

savanna Tropical grassland biome with scattered trees and shrubs in Africa, South America, and Australia

sediment Material deposited by water, wind, or glaciers

shrubland Biome containing plants such as short trees and shrubs

southern hemisphere Half of Earth south of the equator

species Scientific term meaning a kind or type of organism that can breed to produce offspring that can also interbreed successfully

steppe Extensive temperate grassland biome present in Europe and Asia

subspecies Local type

taiga Major biome present in northern Canada, southern Alaska, Scandinavia, Siberia, and parts of Japan; mostly evergreen forests, bogs, marshes, and small lakes

teat Nipple of a mammary gland

temperate grassland Large area within temperate zone covered with grass

temperate rain forest Woodland area within temperate zone covered with dense growth of trees and brush, with heavy annual rainfall

temperate zone Region between the Tropic of Cancer and the arctic circle or between the Tropic of Capricorn and the antarctic circle



territory Area occupied by a single animal or group of animals of the same species

threatened species Any species that is at risk of becoming endangered

tropical forest Woodlands of tall, broadleaved, evergreen trees forming a continuous canopy that receive at least 100 inches of rain each year; includes rain forests; present in the Amazon region of South America, parts of Africa (Democratic Republic of the Congo, Congo, Gabon, Cameroon), and Asia (Indonesia, Papua New Guinea, and Myanmar)

tropical grassland Savanna, which lies north and south of equatorial tropical rain forests

tundra Major treeless biome characterized by dark soil with a permanently frozen subsoil and plants such as lichens, mosses, herbs, and dwarf shrubs; present across the northern coasts of Alaska, Canada, Greenland, Scandinavia, and Russia

vertebrate Animal with a backbone

wean To change from a diet of mother's milk to alternative, more solid food; begin eating solid food

womb Organ in female mammals in which unborn mammals develop (uterus)

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INTERNET RESOURCES

All About Mammals
Check out mammals, their evolution, and classification.
www.enchantedlearning.com/subjects/mammals

American Museum of Natural History
Visit the mammal halls and travel across continents.
www.amnh.org/exhibitions/permanent/mammals/

Animal Diversity Web
A general site with sections on mammals; search facility for species.
animaldiversity.ummz.umich.edu/site/index.html

Australian Museum Online
Find out about Australia's marsupial mammals.
www.amonline.net.au/mammals

BatAtlas
Information about bats.
online.anu.edu.au/srmes/wildlife/batatlas.html

BBC Science and Nature: Animals
Features a mammals site based on the television series by David Attenborough.
www.bbc.co.uk/nature/animals/mammals

BigCats.Com
Online guide to wild cats.
bigcats.com

Canid Specialist Group
Information on wild dogs.
www.canids.org

Cetacea
Online guide to dolphins, porpoises, and whales; includes a guide to whale watching.
www.cetacea.org

Dian Fossey Gorilla Fund International
Conservation of gorillas and their habitats.
www.gorillafund.org/index.php

Elephants of Africa
Information, contests, and puzzles on the life of elephants.
www.pbs.org/wnet/nature/elephants

eNature Field Guides
The U.S. National Wildlife Federation Web site features mammals of North America.
www.enature.com/home

Fossil Horses in Cyberspace
Virtual museum exhibit examining the evolution of horses.
www.flmnh.ufl.edu/natsci/vertpaleo/fhc/fhc.htm

IUCN Red List of Threatened Species
Worldwide assessment of the conservation status of species of living organisms.
www.iucnredlist.org

National Primate Research Center, University of Wisconsin
Find out about primates.
pin.primate.wisc.edu/aboutp

National Wildlife Federation
Gray wolves in North America.
www.nawa.org/about_wolves.html

Seal Conservation Society
Conservation news about seals.
www.pinnipeds.org

Smithsonian Institution National Museum of Natural History
A searchable database of all living mammals of North America.
www.mnh.si.edu/mna

Tasmanian mammals
Details on bats, whales, monotremes, marsupials, and rodents living in Tasmania.
www.dpiw.tas.gov.au/inter.nsf/ThemeNodes/LBUN-5362ZN?open

Ultimate Ungulate Page
Find out about the world's hoofed mammals, including hyraxes, elephants, dugongs, and many others.
www.ultimateungulate.com

World Wildlife Fund
Find out more about wildlife conservation.
www.worldwildlife.org

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